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ABSTRACT

This document is the annual report on the educational research and research-related activities carried out pursuant to the authorizations of the Cooperative Research Act for the fiscal year ending June 30, 1969. The master focus of the report is on the educational research, surveys, and demonstrations, the information dissemination activities, and the research training receiving Cooperative Research support administered by the National Center for Educational Research and Development, Office of Education. To place these activities within the context of the Office's support for educational research, the report also includes general information about activities funded under other authorizations for research and related activities. The activities discussed are subsumed under two main headings: 1) major continuation programs and 2) projects in specified areas. Major continuing programs include such organizations as the Educational Resources Information Center and the nine Research and Development Centers. Projects in specified areas cover a wide range of topics, from early childhood education to teacher education. (RT)

HIGHLIGHTS

Cooperative Research is a partnership in which support is provided by the Federal Government for educational research activities conducted outside the Office of Education. This partnership was authorized by the Cooperative Research Act in 1954 and initially funded with $1 million in fiscal year 1957. The act, as subsequently expanded, was the source of almost $91 million in fiscal year 1969 obligations. This included $72 million for research, development, demonstration, and dissemination activities and training of educational researchers, and $19 million in research facilities appropriations carried over from earlier fiscal years.

In fiscal year 1969, more than 800 separate educational research activities, ranging from small projects to a nationwide network of educational laboratories, were supported under the Cooperative Research Act.

- More than $23 million was provided for Educational Laboratories to further their efforts to create, refine, and demonstrate materials and techniques that educators may adopt to strengthen and advance local programs.

- Almost $11 million was provided to support a broad spectrum of Research and Development Center activities, including nine centers performing sustained indepth research on major teaching and learning problems, two making studies of future educational needs and alternatives, and a group of institutions coordinating their center-type efforts in early childhood education.

- The Educational Resources Information Center (ERIC) network of clearinghouses collected and disseminated educational research information in 19 substantive areas (12 with support from Cooperative Research and the remainder from other authorizations).

- The monthly journal, *Research in Education*, which publishes abstracts of recently completed research and newly funded research projects, indexed by subject, author, and institution, announced more than 10,000 reports.

- Direct research training was provided for more than 2,500 individuals, including 800 in full-time programs and the remainder in institutes and other intensive short-term training programs.

- Support for over 600 individual research projects totaled more than $26 million and provided answers to a variety of educational needs for improved materials and techniques.

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A summary of educational research projects and programs administered by the Office of Education, submitted under section 2(d) of Public Law 83-531

Annual Report
Fiscal Year 1969
Cooperative Research

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education
Robert H. Finch, *Secretary*
James E. Allen, Jr., *Assistant Secretary and Commissioner of Education*
James J. Gallagher, *Deputy Assistant Secretary and Deputy Commissioner for Planning, Research, and Evaluation*

SP004535

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LETTER OF TRANSMITTAL

Department of Health, Education, and Welfare
Office of Education
Washington, D.C. 20202

April 1, 1970

To the Congress of the United States:

I am pleased to submit the annual report of the educational research and research-related activities carried out pursuant to the authorizations of the Cooperative Research Act (Public Law 83-531, as amended), for the fiscal year ending June 30, 1969. The report is transmitted in accordance with the requirements of section 2(d) of the Act.

The major focus of the report is on the educational research, surveys, and demonstrations, the information disseminating activities, and the research training receiving Cooperative Research support administered by the National Center for Educational Research and Development, formerly the Bureau of Research, Office of Education. Because the organizational change came after the close of fiscal year 1969, references throughout this report are to the Bureau of Research. To place these activities within the context of the Office's total support for educational research, the report also includes general information about activities funded under other authorizations for research and related activities.

Respectfully,

James E. Allen, Jr.
Assistant Secretary for Education
and
U. S. Commissioner of Education

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I. RESEARCH—KEY TO PROGRESS IN EDUCATION

Steady advancement in education depends primarily upon the depth and breadth of a systematic research and development effort, the goal of which is the continued improvement of teaching and learning. Such improvement includes the conditions and processes which influence learning, the form and content of curricular materials, the equipment and organizational arrangements which facilitate learning, and the environment and incentives which encourage learners to use their human resources to advance themselves and society. It also includes dissemination of promising research results, assistance in bridging the gap between research and practice, and the training of research and related personnel to assure continued educational advancements in the future.

The needs for educational improvement are often too great and too crucial for each locality and each State to have to carry out and pay for all the research and development necessary for positive and productive decisions about educational change. Even in areas with relatively abundant staff and financial resources, improvements may be made more rapidly when there is access to systematic research and development results carried on elsewhere. In areas with staff and financial limitations, administrators must look to others for help. Both local and national demands for educational improvement call for a coordinated national effort to advance knowledge about the teaching and learning process and devise materials and strategies which may be adopted in full, or adapted in part, to local needs. It is to this responsibility that educational research activities administered by the Office of Education are directed.

The report that follows summarizes briefly the research role played by the U.S. Office of Education with research support appropriated by the Congress for fiscal year 1969.[1] Emphasis is on the accomplishments under the Cooperative Research Act, which provides the major source of funds for these activities. Where support is from other authorizations, these are cited. The Bureau of Research, which administered most of the support in fiscal year 1969, has since been designated the National Center for Educational Research and Development in the Office of the Deputy Assistant Secretary/Deputy Commissioner for Planning, Research, and Evaluation.

Research incorporated into this report has been selected to show what was accomplished during fiscal year 1969 and what new research was started. A listing of the various ongoing projects and program components has not been included, since records of these may be found in quarterly *Current Project Information* reports, or in specialized lists summarizing research in particular areas. Examples include *U.S. Office of Education Support of Computer Activities* (OE-12044) and *Directory of Research in Social Studies/Social Sciences* (OE-31010). The research project section of monthly issues of *Research in Education* keeps educators abreast of newly funded research supported by the Office of Education.

Significant interim or final reports of supported research and development are available through the Educational Resources Information Center (ERIC) and are abstracted in the monthly journal *Research in Education.* Detailed monthly indexes are incorporated in cumulative semiannual and annual indexes. (See page 17 for further information about the ERIC services.)

To place activities within the appropriate context, this report first treats the goals and priorities which affected research supported in fiscal year 1969, the kinds of research functions carried out and sources of funds, and the procedures for managing the research effort. A second section describes major continuation programs, shows how programmatic research and project research complement and supplement each other to provide systematic coverage, and outlines missions and accomplishments of the various program components. The third section highlights examples of productive activities in a variety of specific substantive or service areas. A brief concluding section summarizes research accomplishments for fiscal year 1969 and suggests the direction of subsequent activities to be undertaken.

PRIORITIES FOR EDUCATIONAL CHANGE

A number of factors are considered by society in determining its educational priorities. These factors include rapid changes in technology and postindustrial culture, major population relocations from rural to urban and urban to suburban environments, occupational changes from generalized to specialized work, life-style adaptations from independent to dependent relationships, and the revolution of rising expectations for individuals and groups. All of these contribute to the ultimate determination of immediate and long-range research and development priorities. Indeed, the pressures for educational advances needed to cope with immediate social problems and opportunities have been so great that the Office of Education has taken deliberate precautions to reserve some of its research investment for basic studies vital to long-range research and development.

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[1] For a discussion of educational research financed through other Federal agencies, State governments, private foundations, institutions of higher education, and others, see chapter IV of *Educational Research and Development in the United States,* prepared by the Bureau of Research, Office of Education, for the Organization for Economic Cooperation and Development, July 1969. Available from the Superintendent of Documents, U.S. Government Printing Office (OE-12049), price $2.

The Office of Education's response to emerging priority needs becomes fairly evident from an analysis of investments in critical areas. In fiscal year 1969, substantial portions of available funds were invested in early learning, urban education, preparation for emerging careers, equality of educational opportunity, and improvement of teacher education. Basic studies and curriculum improvement efforts continued to receive attention, as did further development of flexibility in instructional practices and refinement of educational uses of technology. Smaller amounts were invested in a variety of other areas to sustain the forward motion of the total effort or to establish needed bases for measuring progress in the years ahead.

STAGES OF INVESTIGATION AND DEVELOPMENT

Just as there is overlap and shading from one critical area to another, so the research spectrum is seldom a smooth continuum that blends from basic studies through development, demonstration, evaluation, dissemination, and diffusion. One study may serve a basic research function because it produces basic knowledge of long-range value, whereas a similar study is considered applied research because it supplies needed information for immediate action. Also, development activities, which create, produce, or identify materials, practices, or conditions which represent improvements may require supplemental "basic" studies for information needed for successive developmental stages.

Both demonstration and evaluation may be part of the culminating phases of development, or they may be carried out as distinct functions apart from developmental effort, depending upon their purpose. Demonstration is thus an important research function when there are effective research and development results to demonstrate, and evaluation is an important research function when it facilitates progress to higher efficiency or performance levels.

The term dissemination is usually reserved for efforts to communicate the results of research and development by printed materials or other media, whereas the term diffusion has come to include the human strategies necessary to help localities put into use those programs and practices which they have selected to adopt or adapt.

Often feedback from practitioners may lead to new investigations and subsequent developments which produce even better results. The more comprehensive research activities frequently carry multiple functions, with provision for feedback and adjustment along the way. Even the smallest research activity benefits by the back-and-forth communication between researchers and practitioners as their mutual efforts nourish and motivate educational improvements.

Research training, although not part of the research-development-dissemination continuum, represents an important investment in future research by providing trained manpower necessary to solve continuing and forthcoming educational problems. Similarly, the investment in research facilities contributes to future research by providing appropriate equipment and more permanent settings for persistent research efforts.

LEGISLATIVE AUTHORIZATIONS FOR EDUCATIONAL RESEARCH

The basic legislative authorization for research activities in the U.S. Office of Education is derived from the 1867 statute which created a Federal Department of Education "... for the purpose of collecting such statistics and facts as shall show the condition and progress of education in the several States and Territories, and of diffusing such information respecting the organization and management of schools and school systems, and otherwise promote the cause of education throughout the country."

The role of collection, collation, and dissemination was furthered in the following decades and the products diffused revealed how socioeconomic conditions had affected the rapidly growing school organization. Near the beginning of the century (1896) this role was expanded to include the preparation and publication of bulletins about educational conditions in the United

States and to cover worldwide educational activities of interest in the United States. The analysis of statistical data about school enrollments, costs and expenditures, new types of equipment, opening of school laboratories and libraries, vocational educational offerings, teachers' salaries and training, and other data revealed the changing patterns of education as the Nation developed.

Through this legislative framework, always interpreted to include some research as a major function, the Office of Education continued until the mid-1950's to furnish information and consultative services to State and local administrators and teachers who were faced with new and different problems that followed two World Wars, from which the United States emerged in a new and challenging position of leadership.

The new scientific and atomic age had brought about social and economic pressures upon educational systems—not only in the United States but also in other countries—and urgent demands for better quality education for all citizens called for systematic research and development to solve difficult educational problems. Many educational concepts and accepted theories were being questioned; new curriculums were needed to replace outmoded ones. New vistas of learning were opening; new avenues for development were emerging. The pressures for Federal funds, not for research and development alone, were now multiplying as the role of the Federal Government shifted to face the new era.

To understand this changing operational role, it is important to be aware that any educational research effort in the United States must be responsive to local school systems. Because local groups have extensive authority over district schools, support and educational practice vary widely among the States and territorial jurisdictions.

With the passage of the Cooperative Research Act, July 26, 1954, Congress provided the initial authorization for use of Federal funds in support of systematic educational research outside the Office of Education. This was followed by other more specialized educational research authorizations, spurred on by the Soviet launching of the first man-made earth satellite (Sputnik) in 1957, a feat which challenged the United States to improve its scientific and technological education. The research authorizations discussed here were administered by the Office of Education in fiscal year 1969.

Cooperative Research

The Cooperative Research Act (Public Law 83-531) was the major source of funds for educational research administered by the Office of Education. Passage of the act in 1954 represented recognition by the Congress that systematic educational improvement was a partnership effort between the Federal Government and those institutions and agencies concerned with the quality of teaching and learning in the new scientific and atomic age. This act was first implemented with about $1 million in Office of Education salary and expense funds beginning in fiscal year 1957. (See table 1 for amounts obligated for research activities under the Cooperative Research Act and other legislative authorizations from 1957 through 1969.) The act initially authorized the Commissioner of Education to enter into jointly financed cooperative arrangements with universities and colleges and State education agencies for the conduct of research, surveys, and demonstrations in the field of education. The act was expanded by title IV of the Elementary and Secondary Education Act of 1965 (Public Law 89-10) to include dissemination of information derived from research, training of personnel for educational research and research-related fields, and construction of facilities for research and research-related purposes. The 1965 provisions also permit individuals, private industry, and nonprofit agencies to participate in supported activities. It was further amended by Public Law 89-750 (title I, part D, 1966) to permit the research training programs to be carried out by contracts as well as grants and to broaden construction of research facilities to include acquisition and replacement of existing buildings. Support, which had gradually increased between 1957 and 1965, took a substantial leap in fiscal year 1966. Cooperative Research support available in fiscal year 1969 was administered almost exclusively by the Bureau of Research. Exceptions were a few special surveys and evaluation studies contracted for by the National Center for Educational Statistics and the Office of Program Planning and Evaluation.

Handicapped Children Research and Demonstration

The second largest source of research support obligated in fiscal year 1969 was the Mental Retardation Facilities and Community Mental Health Centers Construction Act of 1963 (Public Law 88-164), as amended. Related support came from the research component of Media Services and Captioned Films (Public Law 85-905), as amended. The Bureau of Education for the Handicapped was prescribed in Public Law 89-750, which amended the Elementary and Secondary Education Act of 1965. A new title VI required a separate bureau in the Office of Education to deal with the education of handicapped children and youth. The two authorizations provide support for research and demonstrations relating to education for the mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, crippled, and other health impaired children who need special education. The purpose was to determine new and improved methods for educating the handicapped and to develop systems by which educational personnel could make use of these new methods and techniques.

Vocational Education Research

The third source of support, in terms of amounts used during fiscal year 1969, was authorized by the Vocational Education Act of 1963 (Public Law 88-210). Section 4(c) specifies that 10 percent of the funds appropriated under section 2 of the act "shall be used to pay part of the cost of research and training programs and of experimental, developmental, or pilot programs" to improve vocational education, especially for youth in economically depressed areas who have academic or socioeconomic handicaps which prevent them from succeeding in regular school programs. Since fiscal year 1967, funds available for vocational education research have been based on an interpretation that the above provision means "up to 10 percent."

Language Development Research and Studies

Legislative authority granted through title VI of the National Defense Education Act (Public Law 85-864) authorized the Commissioner to support studies and surveys to meet the need for increased and improved instruction in modern foreign languages and the areas where they are spoken. This research is administered by the Institute of International Studies.

The provision for Educational Media Research and Dissemination, authorized by title VII of the same act, expired at the end of fiscal year 1968, and subsequent media research was absorbed under provisions of the Cooperative Research Act.

Library Research and Development

Support for library research and development during fiscal year 1969 came from authorizations under title IIB of the Higher Education Act of 1965 (Public Law 89-329). Under the terms of section 224 of this title, the Commissioner of Education was authorized to support research, demonstration, and dissemination projects relating to the improvement of libraries or the improvement of librarianship training, including the development of new techniques, systems, and equipment for processing, storing, and distributing information.

Foreign Currency Financed Research

Under Public Law 83-480, the Agricultural Trade Development and Assistance Act of 1954, as amended, a portion of the Nation's foreign currencies may be used for financing a range of research and related activities in specified countries. The Office of Education's part of the program is administered by the Institute of International Studies.

Research Under Other or Combined Authorities

In a few instances, cooperative financing arrangements for research activities were made between the Bureau of Research and other units of the Office of Education or with other agencies. For example, programs to upgrade the training of vocational education personnel were supported out of appropriations from the Education Professions Development Act (Public Law 90-35). Administering and financing such arrangements is worked out between cooperating units or agencies in accordance with program elements and support authorizations involved.

MANAGEMENT OF THE RESEARCH EFFORT

At any given time, the Office of Education's research management represents an effort to serve future educational needs by judicious funding (sometimes abridgment) of past commitments and adding new research activities which show greatest promise for meeting educational improvement needs. The human element in this continuous planning and management chain is composed of staff who handle the day-to-day responsibilities for planning and administering the authorizations plus nongovernmental experts who serve on a Research Advisory Council or provide other evaluative assistance on specific programs and proposals. The bulk of available support is administered through the central Office of Education, but a special program of small project research (up to $10,000 in Federal funds) is administered through the Regional Offices.

When the total available research support remains constant or increases, the broad Cooperative Research mandate holds great potential for flexibility in attacking major and emerging educational problems. When spend-

Table 1.—Federal investment in educational research and related activities from legislative authorizations administered by the U. S. Office of Education: Fiscal years 1957-69[1]

(Obligations in millions of dollars)

Legislative authorizations	Fiscal years												
	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Cooperative Research Program, Public Law 83-531, as amended	1.00	2.31	2.67	3.20	3.36	4.64	6.98	11.50	15.84	50.69	57.64	66.56	86.90[2]
Language Development, Research and Studies, Public Law 85-864, title VI			2.39	4.01	1.98	2.00	1.80	1.82	2.55	2.79	3.09	2.93	2.75
Media Research and Dissemination, Public Law 85-864, title VII			1.60	3.07	4.73	4.75	5.00	5.00	4.96	3.85	4.37	3.72	4.03[2]
Foreign Currency Financed Research, Public Law 83-480					.02	[3]	.01	.39	.22	.56	.51	.22	.09
Research component of Media Services and Captioned Films, Public Law 85-905, as amended							.11	.20	.25	.30	.45	.65	1.15
Education of the Handicapped: Research and Demonstration, Public Law 88-164, as amended								1.00	2.00	5.99	8.09	10.79	13.59
Vocational Education Research and Training, Public Law 88-210, sec. 4(c)									10.26	17.14	9.97	13.00	13.49[4]
Library Research and Development, Public Law 89-329, title II B											3.38	2.03	2.99
Total	1.00	2.31	6.66	10.28	10.09	11.39	13.90	19.91	36.08	81.32	87.50	99.90	124.99

[1] Authorizations listed in order of funding.

[2] Media research was added to Cooperative Research appropriations as a line item.

[3] Less than 0.01 million.

[4] Includes $1.99 million transferred from Public Law 90-35.

SOURCE: Data through fiscal year 1966 from Grants-in-Aid and Other Financial Assistance Programs Administered by the U. S. Department of Health, Education, and Welfare, 1967 edition; data for 1967-69 from Budget Estimates, except Foreign Currency Financed Research, and research component of Media Services and Captioned Films, which are from program records.

ing restrictions reduce obligations below established levels, as was the situation in 1968 and 1969, Cooperative Research feels double pressure—from reductions in its own planned activities and from encroachments to fill critical gaps in other programs. The apparent increase in Cooperative Research obligations in 1969 over 1968, as shown in table 1, should not be taken at face value. It includes almost $19 million of carry-over construction funds plus specially budgeted amounts for the National Achievement Study and certain kinds of evaluations and statistical surveys. It also includes funds for media research formerly funded under title VII of the National Defense Education Act. When these items are subtracted, the amount of Cooperative Research discretionary support available in fiscal year 1969 for the kinds of projects and programs supported in previous years was actually somewhat less than in fiscal year 1968.

As a consequence of all these restrictions on discretionary funds, both the Office of Education's staff and its Research Advisory Council had to look for practical compromises to make the most effective accommodations of prevailing pressures. Furthermore, the mounting demands for educational research were not peculiar to fiscal year 1969. The Congress had earlier anticipated their emergence by expanding the Cooperative Research Act in 1965 to include provisions for development and dissemination and to broaden eligibility for participating in the research effort. The problem in 1969 was primarily one of stretching available resources to respond to the most serious mounting pressures without dangerous fragmentation of effort. For example, steps were taken to reduce the number of educational laboratories so that available funds could be used to cover normal rising operational costs of the more productive ones. Also, since general project research support was not available for all areas needing attention, important decisions had to be made about where research dollars would produce the most significant results. In other words, the research planning and management effort in fiscal year 1969 was characterized by systematic attempts to concentrate investments where they would make the greatest impact or provide the products most needed by the schools and at the same time to reserve some funds for outstanding research to meet unanticipated needs.

Against this kind of demand for research findings and products, continuous planning was built around checkpoints corresponding to meetings with advisory groups and preparations of budget statements. The plans were later adapted and refined to conform to appropriations and budget allocations. Within this framework, projects and programs supported in fiscal year 1969 represent a continuous response to educational improvement pressures.

Continuation activities are regularly reevaluated by staff and nongovernmental specialists, often with site visits, to determine the level of funding for each new period. Proposals for new support are processed according to their size and complexity. The larger and more complex the proposed activity, the greater detail in which the proposal plan is evaluated.

In fiscal year 1969, 752 new proposals were formally received and processed by the Bureau of Research and 236 of these were subsequently funded; in addition, 984 requests for small project support were processed by the regional offices and 314 of these were subsequently funded. These numbers do not include informal activity descriptions which potential applicants sent in for preliminary review and suggestions.

The funding of an activity represents the culmination of a positive and deliberate selection process; however, proposals may be dropped from further consideration at several points in this process and for a variety of reasons:

1. To be eligible for support, proposed activities must be research or research-related, and they must be concerned with education. Those which clearly do not meet these criteria are returned to the applicant without further processing but with an explanation that they are ineligible for consideration.
2. Applicants whose proposed research obviously duplicates completed or ongoing studies may be informed of this duplication and invited to withdraw their requests before the proposals are disapproved.
3. Similarly, applicants whose proposals are extremely vague or lack soundness of design or procedure may be invited to withdraw their requests and redirect or strengthen them for formal evaluation by outside experts.
4. Sometimes panel review is the point at which proposals are dropped from further consideration. The Regional Research Program uses panels to recommend choices among small project proposals, and the Bureau of Research uses panels to help determine awards for certain clusters of proposals. For example, a panel studied the 75 initial proposals in the Teacher Education Development Program and recommended those to receive support for further development.

5. Because funds are not available to support all the worthy unsolicited proposals which are received, evaluations by staff and nongovernmental specialists are used to determine which applications best meet the established selection criteria: educational significance; soundness of design, procedure, or plan; adequacy of personnel and facilities; and economic efficiency. A proposal may be dropped from further consideration because of serious weaknesses on one or more of these criteria.
6. From the remaining proposals, final selection becomes a matter of choosing the best combination of the best projects to meet carefully defined research goals established with the advice and assistance of the nongovernment Research Advisory Council. Once this selection is made, proposals which are not as good as those finally recommended for funding may be dropped from further consideration and the applicant so notified.
7. Proposals which show great promise but which do not fill the most pressing current needs may be deferred for later Office of Education consideration, or withdrawn and submitted elsewhere.

Staff members and field readers who have had extensive experience with proposals report that the quality of applications has been consistently improving. In spite of this, however, numerous proposals have fallen short of selection simply because funds are not available to support them.

To cope with pressures for available funds, staff responsibilities for program development have been organized around systematic efforts to converge upon the best possible program combinations, rather than simply to support the "best" proposals which came in for consideration. Groups organized to deal with critical issues or areas needing attention attempt to clarify research missions and spell out relative priorities. Against this background, they develop intermediate and long-range goals, analyze currently supported activities, and identify the kinds of research specifically needed to meet current and anticipated needs.

Staff planning efforts are complemented and facilitated by an organized program of assistance from nongovernmental experts. In various group combinations or as individuals, these are called upon for evaluations and advice about promising activities to be funded or at turning points in project or program developments. To broaden nongovernment participation in major policy and program directions, the Research Advisory Council, appointed by the Secretary of the Department of Health, Education, and Welfare, was increased from 12 to 15 members in August 1968. This Council meets regularly to review policy, programs, and procedures, and to advise about budget requests and proposed allocation of funds. Major new directions come under the purview of this group, as do questions about approaches to long-range or critical problems. The National Advisory Committee on Educational Laboratories also continued its systematic evaluation of the laboratory and research and development center programs in fiscal year 1969, and various ad hoc groups were called upon for specialized kinds of advice.

While steps were being taken to strengthen planning and management, staff continued their day-to-day work to monitor ongoing activities, and adapt and move forward the pieces of the total research program, and at the same time to inform and keep informed. Application and review procedures had been standardized earlier, and the status of activities currently being funded could be tracked through the Bureau of Research Information Control System (BRICS) during the monitoring period. Furthermore, reports of results from past investments were regularly fed into the Educational Resources Information Center (ERIC) and abstracts reported in its monthly journal, *Research in Education.*

Perhaps the most important thing that can be said about research planning and management during fiscal year 1969 is that while staff carried extra responsibilities in analyzing research needs, they were at the same time improving their professional capabilities for administering a systematic program of Federal support for educational research and related activities.

ANALYSIS OF THE 1969 RESEARCH INVESTMENT

The fiscal year 1969 research focus was tightened within activities and intensively coordinated among related activities. Table 2 summarizes support information under the various authorizations, and table 3 summarizes data about total obligations according to the kinds of activities and the nature of beneficiaries.

To arrive at the percents in table 3, each activity was coded according to its major emphasis under each classification. Under this system, obligations under any one category are mutually exclusive of those in other categories in that array. There are some advantages and some disadvantages in this. For example, obligations are counted only once; but the multiplier effect which results from coordinated efforts is lost. In actual

Table 2.—Summary of obligations for research and related activities administered by the U. S. Office of Education, by legislative authorization: Fiscal year 1969

Legislative authority	Obligations		Number of activities	
Authorizations administered by Bureau of Research				
Cooperative Research Program (Public Law 83-531, as amended)[1]		$90,931,807		806
Project research activities:				
General education research and development projects	$21,548,379		574	
National achievement study, statistical surveys, and evaluations	2,243,059		36	
Program research activities:				
Educational laboratories	23,361,860		20	
Research and development centers	8,139,626		9	
Early childhood laboratory system	1,707,213		1	
Policy research centers	995,636		2	
Educational resources information center activities	3,325,852		20	
Research training programs	6,709,396		120	
Construction and equipment at laboratories and centers	18,873,853		13	
Educational media research and dissemination (10 projects, 1 ERIC clearinghouse)	4,026,933		11	
Vocational Education Research and Training (Public Law 88-210, sec. 4(c)) (includes project research, State research coordinating units, 2 R&D centers, and 1 ERIC clearinghouse)[2]		13,491,305		158
Library Research and Development (Public Law 89-329)		2,986,164		39
Subtotal, research obligations administered by OE Bureau of Research		$107,409,276		1,003
Authorizations administered by other OE units				
Education of the Handicapped: Research and Demonstration (Public Law 88-164, as amended) (includes 14 Instructional Materials Centers, 1 ERIC clearinghouse, 3 research and development centers, and 109 other research and demonstration activities)		13,593,786		128
Research component of Media Services and Captioned Films (Public Law 85-905, as amended)		1,150,000		18
Language Development, Research and Studies (Public Law 85-864, title VI) (includes 2 ERIC clearinghouses, 59 projects, and $300,000 transferred to area centers program)		2,750,000		61
Foreign Currency Financed Research (Public Law 83-480)		91,888		2
Total research obligations		$124,994,950		1,212

[1] Includes $4,026,933 for Media Research and Dissemination, previously funded under title VII of Public Law 85-864.

[2] Includes $1,986,035 from Public Law 90-35 for 16 personnel training institutes.

practice, the amount of investment in a particular area includes obligations for activities with major emphasis in that area, plus some of the obligations from coordinated efforts. For this reason, amounts used in later discussions may sometimes be larger than the percents in table 3 would seem to indicate

By type of institution, colleges and universities are still the primary fiscal recipients of project research support administered by the Office of Education. The relatively large percents going to laboratories and centers in fiscal year 1969 includes substantial obligations for facilities and equipment.

By topical area, investments in curriculum were outstripped by investments in instructional systems. This reflects growing recognition that the knowledge base is changing so fast that improvements must be made in the learning process itself so that individuals are prepared to upgrade their learning throughout life.

By general class of activity, development and development-related research predominate. This is further evidence that support was heavily oriented toward practical materials and techniques for immediate use in the schools.

Most research was carried out within a subject matter context, although funds were also invested in studies of school administration, sociological factors that affect learning, and other areas not specific to a single field. Even with a base (total) that included facilities, the content field could be specifically identified in the titles of activities receiving more than half of the fiscal year 1969 obligations. More than a fourth of the total investment went into research and development for basic knowledge and skills, often multidisciplinary. Investment in activities carried out within academic knowledge and skills fields also showed a marked trend toward multidisciplinary approaches.

By developmental or educational levels of ultimate target groups, more than two-fifths of the total obligations went for all levels or for levels not specifically identified. More than a third went for elementary and secondary education studies. Five percent went for studies limited to the early childhood and preschool level, but some activities classified for their major emphasis at the elementary level also had important elements at the early childhood and preschool level.

By demographic area, about a tenth of the obligation was used for studies emphasizing urban education. Many broad-scale activities coded under "all areas" included efforts to improve urban or rural education.

More than a tenth of the total obligations had major emphasis upon the education of minority groups. These groups could not always be separated. The growing emphasis upon individual differences within the general population would also suggest that minority group education is receiving much attention in general programs.

Table 3.—Features of investments in research and related activities administered by the U.S. Office of Education's Bureau of Research: Fiscal year 1969[1]

($107.4 million = 100 percent)

Distribution	Percent of obligations	Distribution	Percent of obligations
By type of institution receiving grant or contract support		**By general class of activity**	
Colleges and universities	31	Research (basic studies)	6
Regional laboratories	27[2]	Development-related research	22
R&D and policy study centers	22[2]	Development and demonstration	38
Nonprofit organizations	10	Evaluation	3
State education agencies	2	Dissemination	7
Local education agencies	3	Training	6
Profitmaking organizations	3	Provisions for facilities and equipment	18
Other or combination	2	Total	100
Total	100		

*See footnotes at end of table.

Table 3.—Features of investments in research and related activities administered by the U.S. Office of Education's Bureau of Research: Fiscal year 1969[1] —Continued

Distribution	Percent of obligation
By developmental or educational level	
All levels (or level not identified)	43
Early childhood and preschool, not further specified	5
Elementary, not further specified	11
Junior high school	2
Elementary and secondary, not further specified	15
Secondary	8
Postsecondary, not further specified	4
Higher education	8
Occupation specialized and adult	1
Articulation between levels	3
Total	100
By topical area	
Not applicable	13
Curriculum	13
Instructional systems	
General instruction	11
Computer managed or assisted instruction	2
Television and other media	2
Other specific instructional systems	2
Combination	8
Learning processes, individual development, and social influences in education	8
Administration	
Trends, needs, objectives	8
Schools and school systems and services	6
Library and information technology	2
Education personnel	1
Educational Research Training	6
Provisions for facilities and equipment	18
Total	100
By demographic area of ultimate target group	
All areas (or area not specifically identified)	87
Urban, not further specified	9
Central city and urban fringe	2
Rural	2
Total	100
By subject matter field	
Subject matter field not specifically identified	46
Basic knowledge and skills	
More than one field, inter- or multidisciplinary	16
Reading, composition, bilingual education, and other language arts	6
Other basic knowledge and skills	7
Academic knowledge and skills	
More than one field, inter- or multidisciplinary	6
Arts and humanities	2
Social and behavioral sciences	3
Sciences and mathematics	3
Occupationally specialized knowledge and skills	4
Programs for educational professionals	
Curriculum and instruction	3
Other programs for education professionals	3
Educational administration	1
Total	100
By ethnic, racial, or cultural characteristics	
All students (or characteristics not specifically identified)	89
Minority groups, not further specified	7
Negro	3
Other minorities, including Mexican-American and Indian	1
Total	100

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[1] Includes Cooperative Research, Vocational Education Research and Training, and Library Research and Development; does not include research authorizations administered by other Office of Education units.

[2] Includes obligations for facilities and equipment.

II. MAJOR CONTINUATION PROGRAMS

Long-range, programmatic activities concentrate on carefully defined areas or services which need continuous attention over an indefinite period of time. Their strong mission orientation and their ability to build on accumulating experiences and services in their particular areas give them key roles in the total research effort. This anticipation of continuity is a factor that distinguishes programmatic activities from projects, which are prescribed time and cost activities in search of precisely defined goals. Support for project activities thus provides flexibility to change from one area of investigation to another, whereas support for programmatic activities helps to build research and service capabilities in areas of continuing concern. However, the level of continuation funding for programmatic activities is determined by regular review and reassessment of past accomplishments and future goals as these are related to total educational research needs. Whenever a program component is sluggish in fulfilling its mission, or the mission itself ceases to be of major importance, support may be phased out for application elsewhere.

There are two kinds of programmatic activities—those devoted primarily to research and development and those providing important services. Activities in educational laboratories and various research and development centers are examples of the former; research training and operation of clearinghouses in the Educational Resources Information Center (ERIC) system are examples of the latter.

Two diverse examples of indirect, yet major, support for programmatic activities may also be identified at this point. Support authorized by Cooperative Research for construction or acquisition of major educational research facilities is currently available to centers and laboratories which have demonstrated special capability for responding to continuing research and development needs and which have established facility needs. Also, support authorized for vocational education research has been used for the initial establishment of programmatic efforts in State Research Coordinating Units with the understanding that RCU operation is later to be phased over to the States.

LARGE-SCALE RESEARCH AND DEVELOPMENT PROGRAMS

Comprehensive research and development programs build a stable framework for accumulating resources to carry on extensive continuous work. The educational laboratories were established to direct highly competent development and diffusion activities in close association with the schools where innovations are to be adopted or adapted for use. The work carried on by research and development centers is heavily oriented toward problem-oriented research and generation of ideas and models of what is needed or what is feasible for the solution of significant educational problems. Such ideas or models are generally tested in actual school settings. There are many instances where ideas or products developed in the centers are further developed and refined in practical settings by the laboratories.

As noted above, those laboratories and centers which demonstrate particular promise for continuous productive results may also be eligible for major facility support.

Educational Laboratories

During fiscal year 1969, $23.4 million of Cooperative Research funds were used to support the network of educational laboratories, each organized as a nonprofit corporation of regional educators, businessmen, and community leaders and staffed to carry out research and development which is directly useful to education. The laboratories were established through regional initiative, following expansion of the Cooperative Research Act authorized by the 1965 amendments.

Twenty laboratories were initially developed, each with relative autonomy in selecting areas of emphasis and determining its administrative framework. However, because of budget restrictions during fiscal year 1969, the Office took steps to reduce the number of laboratories it supports to the 15 strongest.

The tabulation below shows how laboratory funds were distributed during fiscal year 1969 to serve various student populations:

Student populations	Estimated amount in millions
Total funds used	$23.416
Educational level	
Early learning	10.404
Middle and elementary	11.337
Postsecondary	1.675
Demographic area	
General population	15.026
Urban	5.556
Rural	2.834

Ethnic or cultural groups	
General population	14.812
Negroes	3.134
Spanish-speaking	1.947
Indians	.622
Poor whites	1.021
Other minorities	.420
All disadvantaged ethnic groups	1.460

The summary of laboratory missions, objectives, and major accomplishments on pages 45 to 53 reveals the extent of their educational research and development activites, their widespread participation in field testing and refining curriculum materials and procedures for adoption by school systems, and their cooperative involvement with many groups in the diffusion of promising new educational products. What is **not shown in this table is** how the local school systems have served as supplementary centers and demonstration sites, thus helping others to benefit from this research effort.

Further study of the summary suggests how operational plans and programs developed under regional governing boards have varied, yet how much alike they are in serving a common purpose, the improvement of teaching and learning in the schools. It is also significant to note the priority given to different areas of development—for example, the improvement of urban education, education of minorities or specialized groups—all centered around stated goals.

Although virtually all laboratories started out with strong regional orientation in selected problem areas, they have been quick to recognize that good solutions in one region are sought after for adoption in other regions. Hence, they have worked toward improving interlaboratory communication and coordinating their programs to complement and supplement each other. For example, in developing new curriculums for use in local schools, most laboratories are concerned with both national and regional needs.

During fiscal year 1969, nine laboratories carried out one or more programs to improve the inservice skills of elementary and secondary teachers, while five emphasized general improvement in school organization and operation. Four laboratories had major urban education programs; four concentrated on improving rural schools. Two were concerned with Spanish-Indian and Negro-American educational problems in their regions. Six helped to implement preschool programs; four had special kinds of elementary and high school programs; four had activities involving teacher education; two were concerned with higher education. Most of the laboratories had activities to improve education of the disadvantaged—a continued high priority area. The directors of the laboratories coordinated these program efforts and made long-range plans for their work in improving education.[1]

The scope of laboratory programs is evident in a review of their missions and accomplishments in four broad categories: (1) Individualized instruction, (2) programs for neglected student populations, (3) programs for training teachers, and (4) programs to facilitate educational change. Analysis of programs in these categories reflects interrelated program elements. For example, individualized programs are being developed for educationally neglected students, and individualized instruction techniques are being refined for teacher training.

Individualized instruction.—How to teach a classroom of students with different experiences, abilities, and needs has always been a major teaching problem, but modern communication and population mobility have brought the problem to crisis stage. Slow learners who cannot keep up with the classroom pace or the gifted who seek challenges elsewhere are the major losers when instruction is geared only to the average for a group. Some of the most systematic research and development to relieve this situation has been carried out in a program called Individually Prescribed Instruction (IPI). The program was initially developed at the University of Pittsburgh's Learning Research and Development Center, and the Philadelphia-based laboratory has taken a major cooperative role in field testing and refining the materials and techniques for adoption in schools across the country. Attention has been given to use of computers for monitoring individual and group performance and diagnosing student learning needs. Demonstrations have continued in more than 160 schools involving almost 50,000 elementary school children in 32 States. However, both the laboratory and the center have discouraged premature adoption of the program by schools whose staffs have not had adequate training to use it efficiently.

Different approaches to individualized instruction are being worked on by other laboratories. The Central

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[1] See *The National Program for Educational Laboratories.* Washington: U. S. Government Printing Office, OE-12054, 1969; and chapter V in *Educational Research and Development in the United States,* op. cit. Also, the winter 1970 issue (vol. 3, no. 2) of *Journal of Educational Research and Development,* "Regional Educational Laboratories; Agents of Change," is devoted to a study of the emergence of the laboratory program, the programs of the 15 regional educational laboratories, the nature of educational development, management, and operation of laboratories, and the future of the laboratories.

Midwestern Regional Educational Laboratory, St. Ann, Mo., has been developing individualized instruction packages for learning concepts in esthetics and mathematics in grades K-12. The Northwest Regional Educational Laboratory in Portland has been designing self-instructional packages in arc welding, plastics, electricity, and other subjects, particularly for use in isolated schools with limited staffs.

Programs for neglected student populations.—Many children enter school from environments which tend to limit their achievement. The quality of available programs is particularly important in giving equal educational opportunity to deprived Negro children from the inner-city or rural area. The 5 million Mexican-American children, our second largest minority, often need special programs to overcome language barriers, poverty, cultural isolation, and discrimination. Also, many Indian children, particularly those taken from parents and regimented into boarding schools, need special programs to overcome conflicts of cultures which result in high poverty and unemployment. Others who need special programs include students in rural areas where small or isolated schools lack good equipment and specialized teachers.

Most of the laboratories seek to accommodate the needs of some of these groups. For example, programs dealing with education of children who have language or cultural differences are being carried out by the Southwest Educational Development Laboratory, Austin, Texas; Northwest Regional Educational Laboratory, Portland, Oreg.; Southwest Regional Laboratory, Inglewood, Calif.; and the Southwestern Cooperative Educational Laboratory, Albuquerque.

Programs dealing with education in the inner city are the major focus of the Center for Urban Education, New York City, and related programs are also carried by the Portland and Minneapolis laboratories. Education of children from isolated areas is a major emphasis of the Appalachia Educational Laboratory, Charleston, and some activities in this area are also carried by the Southeastern Education Laboratory, Atlanta, and by the Portland laboratory. The Central Midwestern Regional Educational Laboratory, St. Ann, Mo., is working to improve the education of children who have learning difficulties because they are autistic or hyperactive.

Programs for training teachers.—To improve the skills of teachers, the Far West Regional Educational Laboratory (Berkeley) continued to test the use of minicourses based on research from the Stanford Center for Research and Development in Teaching. Minicourses provide a technique for teachers to practice and test their skills after watching videotaped practice sessions with small groups of students. The Portland Laboratory continued its efforts in school staff communication skills and decisionmaking and the systems approach for teachers. The Educational Development Center in Newton (Mass.) did further work in inservice teacher training programs in four pilot communities, utilizing games, films, videotapes, individualized instruction, and "instant curriculum" built around contemporary events. The Mid-Continent Regional Educational Laboratory in Kansas City continued efforts to prepare inner-city teachers in a 16-week cooperative teacher education program with small liberal arts colleges. And the Regional Educational Laboratory for the Carolinas and Virginia (Durham) continued programs to improve instruction in 2- and 4-year colleges. All of the laboratories were developing appropriate teaching materials or procedures to go along with whatever programs they were developing to help students learn.

Programs to facilitate educational change.—While all of the laboratories were concerned with educational change in the sense of improvement, several were more specifically working on ways to facilitate change through developing improved means for school planning and decisionmaking, information dissemination, and community participation. Laboratories which had significant programs directed toward educational change included the Eastern Regional Institute for Education, Syracuse; Research for Better Schools, Philadelphia; Regional Educational Laboratory for the Carolinas and Virginia, Durham; Far West Laboratory for Educational Research and Development, Berkeley; and the Center for Urban Education, New York City.

Research and Development Centers

Systematic, continuous, and indepth studies to improve education are carried out with Cooperative Research support at nine Research and Development Centers, two Educational Policy Research Centers, and a group of institutions pooling their center-type efforts as a National Laboratory on Early Childhood Education. The fiscal year 1969 Cooperative Research investment in these activities was $10.8 million. Two other research and development centers received $1.7 million in support from the Vocational Education Act of 1963, and three centers were funded with $1.98 million from the authorization for Education of the Handicapped: Research and Demonstration.

All of the center-type activities are at institutions selected for their staff strength and commitment to the area under investigation, and most of them supplement their Federal support with substantial amounts from their institutions and from foundations.

Most of the research and development centers are older than the educational laboratories. In some ways, center success in mounting large-scale research and development efforts served as a prototype for establishment of the educational laboratories. However, the laboratories and centers are designed to complement each other rather than to compete or to duplicate efforts. Along the research-development-diffusion continuum, the work carried on by the research and development centers is strongly focused on problem-oriented research and initial development. The research and development carried out by laboratories is more heavily oriented toward final development or adaptations of materials or techniques to facilitate diffusion and direct use in the schools. In practice, however, the distinction is by no means precise, and hence centers and laboratories coordinate their efforts, often dividing responsibilities according to staff competencies in order to reach mutual goals.

The nine research and development centers receiving Cooperative Research support in fiscal year 1969 were investigating about 30 specific focused programs within the following broad areas: individualized learning, cognitive learning, teaching theory and practice, teacher education, educational administration, the social organization of the school, early and continuous stimulation of learning, and evaluation of instructional programs and educational systems. Cooperative Research support also was used for the center-type research and development carried out by the group of institutions organized as a National Laboratory on Early Childhood Education. A unique feature of this arrangement is a Coordination Center at one of the institutions which serves to bring the work of the component centers into more focused effort. These and center-type activities supported under other authorizations are shown on pages 54 to 66, with details about missions, objectives, and accomplishments.

An analysis of the activities at the centers and educational laboratories reveals where the laboratories and research and development centers have similar functions and wherein they differ. The cooperative work of the Pittsburgh Center and the Philadelphia Laboratory is developing Individually Prescribed Instruction is a good example of center and laboratory coordination. The center places major emphasis on exploring potential improvements and developing models, procedures, and instructional materials and techniques which it tests in school settings, while the laboratory helps with field testing, refining, and developing appropriate delivery systems until the completed program or technique is ready to be adopted, or adapted, for widespread use in the schools.

The newest of the center-type activities receiving Cooperative Research funds are the two policy research centers, sometimes referred to as "Futures Centers" because their particular goal is to provide information which will help educators and the public make decisions about the future course of education. These two policy centers were selected from among five pilot projects funded in fiscal year 1967 to design strategies for forecasting educational needs and potentials. Their objective is to determine alternative courses so that choices can be made in advance of social and technological demands rather than after real or impending crises. The policy research centers use a variety of forecasting techniques and premises to illuminate the nature of basic issues, predict possible alternative futures, and analyze the means available for achieving policy goals in education and the consequences of alternative choices. They are oriented toward the whole educational enterprise; the other center-type activities are oriented toward research and development in specified areas.

The summary on pages 54-6[illegible] concludes with the accomplishments of centers supported under authorizations other than Cooperative Research.

Educational Research Facilities

Educational research reached a new departure point when the 1965 amendments to the Cooperative Research Act authorized support for constructing, remodeling, and equipping major facilities for carrying out educational research. This development came about in response to evidence that many large-scale research and development activities which promised major breakthroughs in educational materials, media, and processes were being handicapped by lack of adequate facilities, particularly facilities where advanced research technology could be applied and advanced educational developments demonstrated. Up to this point, funds for physical facilities had not been specifically authorized, and even the most rudimentary equipment had required exceptional justification.

The 1965 amendments authorized $100 million "for construction of national and regional facilities for research and related purposes" for the 5 fiscal years 1966 through 1970, and the 1966 amendments broadened the definition of construction to include acquisition and replacement of existing buildings. Funds were to be available for grants to public and nonprofit private agencies, or a combination of both, engaged in significant educational research programs, and would remain available until expended. Appropriations were $20 million in fiscal year 1966 and $12.4 million in 1967.

In developing guidelines for the Educational Research Facilities Program, the Office of Education decided to accept proposals on an invitational basis to assure maximum support of educational research priorities. It identified two major objectives for such facilities: to accommodate high quality multidisciplinary educational research, and to increase the number of credible demonstrations of new and improved methods in field sites. To measure the value of proposed facilities against these goals, intensive staff and consultative reviews were to be employed to determine whether the potential applicant's programs were related to major or national educational research and development needs and would contribute to a solution of priority problems over an extended period of time. If an eligible institution passed this initial program review, it might be invited to submit a facility grant application which would then be thoroughly evaluated by a panel of educational research experts, facility consultants, and Office of Education staff.

In spite of the progress made in laying the conceptual groundwork for the Educational Research Facilities Program, and because of administrative limitations on Federal spending, cumulative obligations through fiscal year 1968 amounted to only $2.23 million, most of this for equipment purchases and minor alterations. The University of Wisconsin also received a $109,000 grant for architectural planning of a new facility for its research and development center, thus becoming the first institution to receive support for a major new educational research facility.

For fiscal year 1969, the Bureau of Research, acting on previous policy guidance from the Commissioner of Education and the Research Advisory Council, determined that the Educational Laboratories and the Research and Development Centers should receive top priority for the $30.167 million which remained unobligated from facilities appropriations. By the end of the fiscal year, four institutions had undergone extensive program review and received invitations to apply. On the basis of their proposals, facilities awards were made to the University of Wisconsin, $4.118 million; University of Pittsburgh, $5.629 million; Stanford University, $3.991 million; and Far West Laboratory, $4.770 million. Another $.366 million in fiscal year 1969 funds were used for miscellaneous equipment and alterations in other institutions. At the close of the fiscal year, two other laboratories (the Southwest Regional Laboratory, Inglewood; and the Southwest Educational Development Laboratory, Austin) were well into the review cycle for possible facilities assistance.

TRAINING AND DISSEMINATION SERVICE PROGRAMS

Cooperative Research support is also used for certain programs which are oriented toward services, such as research training, and operation of clearinghouses in the Educational Resources Information Center (ERIC) system. Institutions providing research training must develop effective programs and secure professionally qualified staffs to provide the experience needed by those who will seek careers in research-related activities. Those which operate ERIC clearinghouses must accumulate and maintain extensive material collections and maintain appropriate staffs to analyze those materials, assist users, and perform other dissemination functions.

Other service-related programs include the Instructional Materials Centers, which are supported under authorizations for research on the education of handicapped children; and personnel training institutes and State Research Coordinating Units, both of which are supported under authorizations for vocational education research.

Educational Research Training

The direct training of personnel in educational research, the improvement of the competencies of those already in the field, and the strengthening of programs to train educational personnel were authorized by the 1965 amendments to the Cooperative Research Act. At the inception of the training program in 1966, there were probably no more than 2,200 persons engaged in educational research in the United States, and only a few potential doctorate level researchers from about 15 institutions were annually entering the field of educational research and development. Most of their preparation had been oriented toward educational psychology. Rising demands for curriculum changes, social reforms in colleges and universities, and ways to disseminate research findings were calling for broader and better research training. Researchers were needed to identify problems and their causes and cures and to develop and evaluate new materials and techniques. For the years ahead, projected manpower needs indicate a tremendous growth in demands for research personnel to help give direction to widespread educational reforms.

During 3 years of operation, 1966-69, Federal support for educational research training has helped to provide graduate and short-term training for more than 6,000 individuals. Supported master's and doctoral level educational research training programs have been in operation at 56 institutions across the country. Each year, these programs have enrolled approximately 800 full-time trainees, representing a variety of disciplines and specialities. During 1969, nearly 200 trainees completed doctoral work and more than 50 completed master's degrees in educational research. Since it takes a beginning trainee 3 years to complete a doctoral program, this was the first year that a substantial number had finished and were added to the national pool of professionally qualified researchers. Support given to graduate programs has attracted capable students and stimulated expansion of training programs. In the 3 years, research training was evolving into a new and different kind of profession to meet new and different educational research needs. Among institutions, there was a growing tendency to stress the interdisciplinary nature of educational research and to give students specialized training within a broad program. At the same time, institutes and other short-term training programs were used to upgrade the research skills of many individuals who were performing research functions as professional educators, and support was provided for a limited number of postdoctoral fellows to prepare for highly specialized research.

Graduate and postdoctoral programs.—Over four-fifths of the $6.75 million Educational Research Training Program budget was spent in preparing fully trained professional researchers. Because of budgetary constraints during fiscal year 1969, no new graduate programs were started. This was the third year that funds had not been available to support planned enrollment increases to assure continuous operation of 3-year programs. During this period, all graduate training programs were evaluated as a step toward strengthening or phasing out weaker programs and expanding meritorious ones. The following examples suggest the variety and scope of graduate training in educational research:

The University of Wisconsin provided training for (1) potential directors of research in local school and State educational agencies, and (2) educational research specialists in science and mathematics.

A multifaceted approach to the complex problems of modern education was offered at Stanford University, where participants were trained in five areas: mathematics, psychology, organization and administration, curriculum and instruction, and humanistic studies. Instruction and other experiences were designed to familiarize trainees with basic educational issues and problems, research techniques, and theoretical concepts in one or more areas of concentration.

The University of Nevada's educational research training used an interdisciplinary social and educational psychology approach, using the facilities of the Washoe County public schools, the University of Nevada nursery school, and private nursery schools in Reno for practical laboratory work.

At Syracuse University, a dual program provided for majors in research methodology and in a related substantive or educational field.

The postdoctoral program was designed to equip present educational research leaders for more productive future roles. In fiscal year 1969, 18 postdoctoral fellows selected from more than 100 candidates received financial support to undertake highly specialized training. Successful candidates included a Massachusetts medical doctor researching children's speech problems, an Illinois psychologist investigating adult education needs, a Negro researcher in Louisiana exploring decisionmaking processes among college administrators, and a staff member from the Chicago Institute for Juvenile Research studying the effect of political influences on urban high school cultures.

Institutes and other short-term training.—Educational research institutes and other short-term training projects were designed to upgrade the competencies of individuals who already had some research-related responsibilities. The growing need for such competencies has resulted from demands brought by the many federally supported programs as well as from local concerns for assessing progress in the various school systems. In far too many cases, positions requiring competencies in program planning, development, and evaluation have been filled by educational personnel with inadequate training in the research skills involved in carrying out their assignments. The 75 institutes and short-term training programs supported since 1966 have made it possible for about 4,000 individuals to receive this needed training.

In fiscal year 1969, 1,750 trainees participated in 17 institutes that lasted from a few days up to 6 weeks. The University of New Hampshire, for example, provided 6 weeks of intensive training for educators and administrators who were responsible for making curriculum changes in local, State, and federally funded programs in six New England States. Since most of the curriculum workers were not trained in the theory and design of making evaluation instruments or in processing large volumes of materials, the major objective of this program was to train for effective curriculum evaluation.

At the University of Maryland, in cooperation with the Maryland State Department of Education, 80 individuals were trained in how to identify, write, and evaluate instructional objectives for curriculums in science, mathematics, and the humanities in grades K-12. This training program, presented at a 1-week conference and three follow-up conferences, was designed to develop a curriculum analysis and instructional evaluation mode that could be used for other training programs.

Four special 1-week programs in vocation-technical education at selected universities were undertaken by the Center for Research and Leadership Development in Vocational and Technical Education at Ohio State University, in cooperation with the American Vocational Association. The first of these programs, held at the University of Missouri, was devoted to career development patterns as applied to vocational-technical education. It emphasized the understanding of objectives, content, and outcomes of vocational-technical education and provided training in research to help students make better career choices.

Short-term training programs held as pre- and post-sessions of national and regional meetings of major professional organizations have been highly effective in providing research training for groups of researchers faced with common or similar problems. In fiscal year 1969, this strategy was particularly important in stretching available research support.

Program development.—Few institutions have the resources to provide staff time and consultative services needed to design and implement new research training programs. Although it is true that some opportunities for specialization develop as enrollments grow, this does not fill the need for new programs at additional institutions or for completely new kinds of programs to train researchers for emerging new roles, such as developers and disseminators. During fiscal year 1969, six institutions were granted support to develop new programs or expand existing ones in new directions.

One such program development resulted from cooperative endeavor by the Research Council of the Greater Cities Program for School Improvement (Chicago), together with Northwestern University. The program provides training designed to strengthen the research and evaluation abilities of personnel within large city school systems. The object is to give researchers the insights and skills needed to (1) improve the quality of program evaluation in large city public school systems, (2) develop a means for continually upgrading public school research personnel in gathering, analyzing, and reporting evaluative data, and (3) improve research communication between personnel in public school systems, universities, and the U.S. Office of Education.

Special projects.—Since the Research Training Program was started in fiscal year 1966, a few grants have been made each year for such activities as specialized intern training programs, identification of training needs, development of models for training programs, and the preparation and testing of training materials. A particularly significant special project in fiscal year 1969 was an evaluation of the total Educational Research Training Program and its various components.

Indirect investments in research training.—It is impossible to estimate the incidental and indirect research training which accrues to individuals who work with researchers on projects, prepare reports on research findings, field test programs, or in various ways help disseminate research materials produced in research and development centers, regional laboratories, clearinghouses, and elsewhere. For young workers, this experience may lead to formal training for research careers; for older ones, it at least serves a public relations function for improving dissemination and diffusion channels.

Educational Resources Information Center (ERIC) System

ERIC is a nationwide, comprehensive information system through which educational research and research-related documents are acquired, abstracted, indexed, stored, and disseminated. A key feature of the system is a network of 19 information clearinghouses, each of which specializes in services for a particular field. (See page 20.)

Cooperative Research is the major source of support for the ERIC system, but other appropriate authorizations are used for clearinghouses in a few specialized areas.

Growth in the system's efficiency in fiscal year 1969 was on two fronts: staff production of bibliographical, analytical, and interpretive materials for users, and technological improvements which contributed to better accessibility of documents and of related research information. The 19 clearinghouses received more than 30,000 new documents during the year, of which about 24,000 were retained and abstracted and the most important were entered into the *Research in Education* journal for widespread distribution. Staff prepared interpretive materials for columns in more than 35 professional periodicals reaching about 400,000 subscribers. In addition to acquiring and highlighting important documents for dissemination, clearinghouses published more than 350 special resource documents on specific subjects, and prepared numerous guides to research and instructional materials. Clearinghouse staff also answered numerous mail and telephone requests for research information and gave personal assistance to more than 50,000 educators who used the special document files to find research information in specialized areas.

Two major journals are published monthly. *Research in Education* (RIE), started in November 1966, is a monthly abstract journal which announces new documents added to the ERIC collection and lists newly funded ongoing research activities. Just over 10,000 screened reports were announced in RIE in 1969. By the end of the fiscal year, the journal was reaching more than 4,000 paid subscribers from every State in the Union and 22 foreign countries. Analysis of subscribers shows 35 percent were institutions of higher education and 32 percent State and local educational agencies. The remaining 33 percent were foreign and domestic government bodies, profit and nonprofit groups, and individuals.

In the latter part of fiscal year 1969, ERIC helped start a companion journal, *Current Index to Journals in Education* (CIJE), which covers the literature in educational journals. Each month, approximately 1,000 articles are made easily identifiable by CIJE. Semiannual and annual indexes are available for both of these journals to assist those who want to identify resource materials on virtually any subject in educational research.

Technological progress included use of Linotron from magnetic tape for more rapid computer printouts, introduction of new processes designed to produce hard copy in pamphlet form, and improvements in microfiche (reproduction on a 4x6-inch sheet of film with up to 70 images, requiring a special viewer which projects images for reading). Purchases of reports in hard copy increased from 20,000 in 1968 to 40,000 in 1969, and microfiche sales of documents rose from 2.1 million to 4.7 million in the same period. In addition, close to 300 geographically distributed organizations have standing orders for all ERIC microfiche.

To assist local and State educational agencies and other organized groups in making more effective use of ERIC services, two computer-search developments were initiated during fiscal year 1969. Computer tapes, containing information on all the documents in the total ERIC collection, were made available on loan so that searching of files could be direct instead of through printed indexes. Various uses were made of this tape. For example, North Carolina State University at Raleigh made subject searches to answer faculty queries. In addition, tests for remote search of ERIC files through an organization's own terminals were carried out at the ERIC Clearinghouse on Educational Media and the Office of Education's regional office in San Francisco.

To improve communication among clearinghouses and with Central ERIC, a newsletter, *ERIC Management Notes*, was issued monthly to review guidelines, report developments, and clarify procedures.

In addition to their information storage, processing, and dissemination services, ERIC clearinghouses often carry out research-related projects, such as abstracting, indexing, and preserving conference proceedings and special papers which might otherwise be lost to the research community. For example, the ERIC Clearinghouse on Teacher Education worked with three related professional organizations to prepare a comprehensive reader's guide and summary of the conference on the elementary teacher training models. All clearinghouses receive and process numerous typed and mimeographed reports whose substance then becomes available for researchers.

Other Training and Dissemination Services

Certain other training and dissemination services are the direct or indirect beneficiaries of support authorized for research and related activities. Some of these operate as programs in the sense that they are continuous; others operate as projects, with specified amounts of support for specified services; still others supplement certain Office of Education staff work with contracted services.

The 14 Instructional Materials Centers for the education of handicapped children form a network of services where teachers and others can have access to the latest available instructional materials for use in teaching the handicapped. The centers perform three functions: dissemination of information and materials they have collected and classified; evaluation of materials and production of new materials on a pilot basis; and stimulation of the use of materials found to be effective. The IMC network is destined eventually to be expanded and funded with local support.

Another kind of materials center is operated by a small Office of Education staff, which supplements its services with materials prepared under contract, using

Cooperative Research funds. Called simply the Educational Materials Center, this program provides liaison between educational publishers and local, regional, and international groups interested in newly published instructional materials for use as texts or in libraries. The Center is housed at Federal City College (Washington, D.C.), where domestic and foreign educators use its 16,000 nonlending volumes for study and research. During fiscal year 1969, bibliographies in four special areas were completed and published, one by Center staff and three under contractual arrangements with George Washington University. The resources of the Center are regularly used by the Library of Congress in developing their annual list of *Children's Books.*

Research Coordinating Units (RCU's) in vocational education, which were operational in 46 States in fiscal year 1969, are an example of how States can use Federal support for the initial costs of establishing needed new services. Operating costs are phased over to the States, usually over a 4-year period.

The typical State RCU identifies basic issues and encourages research to solve problems facing vocational education; coordinates occupational research and demonstration activities among educational, business, industrial, and labor agencies within the State; stimulates and assists with experimental projects supported from auxiliary funds; accumulates and abstracts the results of research activities and helps to disseminate them for practical use in operational situations; assists with internal and external evaluation procedures; and generally is active in State efforts to refine operational programs in vocational education.

Short-term vocational training institutes, authorized by the Vocational Education Act of 1963, are research oriented in the sense that they help personnel upgrade their competencies by using the latest findings from vocational education research and development. The specific focus of the institutes shifts from year to year, according to emerging needs. In fiscal year 1969, the major emphasis was on satisfying the occupational needs of youth and adults living in the inner city and in isolated rural areas. Although these institutes serve a dissemination and diffusion function, their purpose—to improve vocational education staff competencies—is not to be confused with that of short-term research training institutes where the objective is to improve research competence per se.

ERIC Clearinghouses and Subject Fields

Adult Education	Syracuse University, Syracuse, N.Y.
Counseling and Personnel Services	University of Michigan, Ann Arbor, Mich.
Disadvantaged	Teachers College, Columbia University, New York, N.Y.
Early Childhood Education	University of Illinois, Urbana, Ill.
Educational Administration	University of Oregon, Eugene, Oreg.
Educational Facilities	University of Wisconsin, Madison, Wis.
Educational Media and Technology	Stanford University, Stanford, Calif.
Exceptional Children	Council for Exceptional Children, Arlington, Va.
English (Teaching of)	National Council of Teachers of English, Champaign, Ill.
Foreign Languages (Teaching of)	Modern Language Association of America, New York, N.Y.
Higher Education	George Washington University, Washington, D.C.
Junior Colleges	University of California, Los Angeles, Calif.
Library and Information Sciences	American Society for Information Science, Washington, D. C.
Linguistics (including neglected languages)	Center for Applied Linguistics, Washington, D.C.
Reading	Indiana University, Bloomington, Ind.
Rural Education and Small Schools	New Mexico State University, Las Cruces, N. Mex.
Science Education	Ohio State University, Columbus, Ohio.
Teacher Education	American Association of Colleges for Teacher Education, Washington, D.C.
Vocational and Technical Education	Ohio State University, Columbus, Ohio.

III. ACCOMPLISHMENTS FROM PROJECTS IN SPECIFIED AREAS

The programs described in the previous section included the dissemination services and large-scale research and development in the laboratories and centers which form the major continuation framework of the Office's educational research effort. This section gives examples of accomplishments from project activities that received support to round out a balanced total effort. Where research appropriations were available in specialized areas, they were used. For the most part, however, Cooperative Research was the major source of flexibility in project support.

During fiscal year 1969, more than $27 million was obligated for Cooperative Research project activities. (See table 2, page 8.) This amount includes budget allocations for special areas, such as media research, the National Assessment Study, and statistical surveys and evaluations. Project costs ranged from a few thousand dollars for activities which could be completed in a few months to large sums for comprehensive studies which continued over several years.

More than $6.8 million was invested in projects to improve education of elementary and secondary school students and more than $2.7 million to improve higher education. This was in addition to support for continuous research in the educational laboratories and research and development centers and small project research monitored through the Regional Offices.

Of the 165 ongoing elementary-secondary education projects, 54 were new, 47 received continuation support, and 64 were ongoing activities that did not receive any fiscal year 1969 funds. About $3 million was used for basic research, including 27 projects recommended under a special arrangement with the National Research Council's Committee on Basic Research in Education. More than $300,000 was used for studies on the reading process, and a similar amount on projects to demonstrate connections between learning and the values and attitudes that affect success in school.

Concurrently with basic research efforts, Cooperative Research support was used for numerous applied research and curriculum development activities. These included projects to improve the training of preschool and elementary teachers, develop new curriculum materials, make effective use of modern educational media, develop effective programs for preschool children, and improve education for children from various minority groups. Concern for the disadvantaged was common to many of these activities.

To simplify reporting, examples in this section have been grouped under convenient headings, and elements of laboratory and center programs are sometimes included. Unless otherwise specified, support is from Cooperative Research. Accomplishments under other research authorizations are included in sufficient detail to place the Cooperative Research effort within the context of the entire research program administered by the Office of Education. Total investments in specified areas are intended only to show relative magnitude. For example, they may include amounts estimated by laboratories and centers in addition to amounts for projects. Also, because there is some overlap between areas, the figures for areas add up to a total greater than that shown for the categories in table 3, the categories being mutually exclusive. A project to improve early childhood education of disadvantaged Mexican-American children would have been included in discussion totals reported for early childhood education and for disadvantaged and minority groups.

RESEARCH TO IMPROVE STUDENT LEARNING

The experiences of young children frequently determine whether they will be interested in learning during the elementary and secondary school years, and their school experiences determine whether they will continue to each successive level and with what success. Furthermore, modern communication and population mobility have contributed to different interests and rates of advancement so that educational experiences appropriate for one individual may not be appropriate for another.

Although research evidence has long shown that individual differences exist, it has only recently attempted to deal with causes. Researchers still have a long way to go to develop a sound base for understanding learning as a process. Developers are busily preparing new instructional materials and designing new educational strategies, but the pace of change keeps outstripping their efforts.

The examples in this section show the accomplishments from some of the research activities supported in fiscal year 1969 to help generate the needed knowledge, programs, techniques, and administrative arrangements which will facilitate learning.

Early Childhood Education

Somewhat over $9 million of fiscal year 1969 funds were invested in research and development activities related to early childhood education. The most intensive concentrations were in the National Laboratory for Early Childhood Education and its affiliated centers in six universities. (See page 61.) Funds were also provided to the Children's Television Workshop to pay part of the initial development and testing costs of the Sesame Street preschool TV program. The University of Georgia's Research and Development Center in Educational Stimulation was concerned with children, starting at age 3, and some of the regional laboratories also carried out extensive research and development related to early education. Cooperative Research funds were also used for some individual projects.

An analysis of funded activities which were wholly or primarily concerned with early childhood education shows that about four-fifths of these funds went for development and development-related research and the remainder for basic research, evaluation, demonstration, and other kinds of research activities. Besides reflecting the relatively high cost of development work, this concentration on development reflects the urgency for materials and techniques for teaching young children in many new programs springing up all over the country. In 1969, continuation support was provided for further development of four or five early childhood education programs that are being implemented in Follow Through and Head Start centers.

In keeping with the trend to move education to earlier ages, the analysis of target groups shows that studies related to education of 3- to 5-year-olds received about 23 percent of the early childhood education research and development investment; 5- and 6-year-olds accounted for another 8 percent, bringing to 31 percent the proportion invested in education below the traditional mandatory school attendance age. At the same time, about 24 percent of the investment was directed toward primary school ages (through grade 3), to improve education in those critical early grades upon which much of later educational success depends. Another 27 percent went for activities with early childhood components in categories labeled "elementary" and "elementary and secondary, not further specified."

The ethnic, racial, cultural, or religious character of the target group could be identified in activities using about a fourth (27 percent) of the early childhood education research and development investment. However, it was difficult to develop precise subcategories because minority groups with similar problems were often treated together. Mexican-Americans, where language was a distinguishing factor, accounted for activities receiving almost 3 percent of early childhood education research funds. The relatively large proportion of funds under the "general population" category may indicate a shared assumption among educators that basic early learning processes are similar for all.

By demographic area, central city and other urban children were the target group for about 10 percent and rural children for about 4 percent of the early childhood education research and development investment. Analysis of the investment by special characteristics of the target group shows that 12.6 percent went for studies related to culturally deprived children, 5.5 percent for foreign language speakers, and 9.7 percent for other special groups.

Classified according to instrumental group or users of the early childhood education research results, 48 percent of the money went for findings specifically useful for instructional staff, including inservice teachers; 15 percent, for both professional and nonprofessional personnel, including teacher aides and paraprofessionals; and 15 percent for combined groups, sometimes including noneducators. Seven percent was for studies of special interest to administrative staff, thus serving those in positions of leadership to implement findings. The 14 percent directed toward research and development staff is consistent with other classifications of development-related research reported by participants. Scarcely 1 percent of the funds went for activities identified as serving trainers of teachers. This could mean that teacher trainers are using materials initially slanted toward other audiences or it could signify a gap in the research and development effort.

Analysis of investments by certain other topical areas shows that 52.5 percent of the funds went for activities which were oriented specifically toward curriculum, 13.8 percent toward instruction by television and other media, and another 6.4 percent toward other kinds of instructional systems and practices, including computer-managed or computer-assisted instruction. The relatively large proportion going for media-related instruction represents a substantial investment in the Children's Television Workshop. More than 12 percent of the early childhood research money was invested in studies related to individual development and learning processes, and 8.5 percent in school management and personnel.

Although content areas are less precisely defined for young children than for those in the higher grades, the subject matter field could be identified in studies receiving 74 percent of the early childhood education research and development investment. This included 28.2 percent in curriculums covering more than one field, 19.4 percent in reading, speaking, and composition, and 8.7 percent in the arts. The remainder was scattered over a number of areas, including 3.9 percent in language arts, 3.5 in English as a second language, and 3.5 in problemsolving. Much of the relatively large investment in the arts represents one laboratory's major emphasis upon creative and performing arts.

Motivation and Other Factors That Affect Learning

Studies in the affective domain represented a coordinated basic research effort to explain the connection between learning and all those human elements—motives, values, attitudes, creativity, and self-concepts—that affect success in school but are so little understood. For example, a project funded at the University of Illinois studied the effects of personality, motivation, and reward on the learning of high school students. A project at George Peabody College sought to develop new measures of values and value conflicts among elementary school personnel, pupils, and parents; and one at the University of Hawaii investigated the differing values among social, cultural, and occupational groups and school personnel in Hawaii. A final report from a project at the University of Southern California provided further evidence suggesting that learning is often a process of redefining and reinterpreting known information against a background of learning resulting from earlier interests.

Actual and perceived consensus on educational goals often affects student motivation for learning. A project at Columbia University's Bureau of Applied Social Research found that mothers and teachers usually want schools to stress intellectual goals, as opposed to social, practical, and personal ones, and that alienated students are more likely to cheat to reduce conflicting pressures from parents, teachers, and peers.

Some children simply do not know how to learn. One project on afterschool study centers explored the potentials and limitations in the use of volunteers in inner-city education. Experiments in three different centers showed that reading-retarded pupils, when tutored for at least an hour a week on a one-to-one basis, made remarkable gains. Another study confirmed the fact that student tutors, even those who had not themselves been achieving well, improved their own learning as a result of experience in tutoring others who knew even less.

Numerous projects to improve education of minority groups had components which were concerned with motivation and other elements that affect learning. The most comprehensive efforts at pacing learning according to individual differences, which often have motivational overtones, were carried on as part of Individually Prescribed Instruction and Individually Guided Instruction, with leadership from the educational laboratories and research and development centers. Some individualization was also studied in computer-assisted instruction. In a related study, Northwestern University assessed pupil attitudes and achievement in a special nongraded school and concluded that a nongraded organization encourages conceptual maturity and participation in group activities and that this growth is evident in behavior of pupils identified as underage, normal age, and overage.

Reading

During fiscal year 1969, reading research advanced along three fronts. Interpretive studies of what was already known from reading research were prepared for distribution to target educational audiences. A new technique was identified to converge future support on research which would provide the most effective solutions to reading problems. At the same time, ongoing and new projects were developing new approaches to improve reading skills and develop new strategies to interest children in reading.

The ERIC Clearinghouse on Reading (Indiana University) prepared four interpretive reports in the PREP (Putting Research into Practice) series.[1] These targeted reports show the progress reading research has already made in investigating methods and providing evidence to improve the teaching of reading and to remedy reading problems. As shown in the reports, the teacher is the key to the reading program and diagnostic teaching is necessary for the application of appropriate corrective materials and techniques. Current research findings are interpreted in these reports to help teachers, other educators, and parents put into effect what is now known about teaching reading, until further studies can answer still other questions about why some children learn to read while others do not.

Recent evidence indicates that basic research about reading as a process may point the way to help every child fulfill his right to read. Such research would determine how reading is affected by interaction among a child's fundamental perceptual and psychological processes and the sociological, environmental, and situational factors which govern his learning. Phi Delta Kappa was awarded a contract to apply the Convergence Technique to the planning of a reading research program. The resulting research and development plan specifies needed work, feeds in past and current research findings, and then narrows the scope of future research until all efforts converge on a goal. The Office of Education has since been using the Convergence Technique and the plan developed by Phi Delta Kappa to manage its Targeted Research and Development Program on Reading. The goal of the new program is to teach every child in a national sample to read so well by age 10 that he later becomes a competent adult reader.

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[1] Now available in one volume from Superintendent of Documents, U.S. Government Printing Office, as OE-30026, *Treating Reading Difficulties—The Role of the Principal, Teacher, Specialist, and Administrator.* $1.50.

Other studies in progress during fiscal year 1969 included an analysis of reading skills (Cornell) and development of readability formulas to show the difficulty of language comprehension (University of Chicago). Content analysis and children's responses to first-grade readers in the United States and foreign countries were the subject of a project at the University of Colorado. The University of Pittsburgh studied vocalism in silent reading and two approaches to reading instruction, and Glen Cove (New York) District Schools were working on identification and remediation of perceptual handicaps in learning to read.

Many of the laboratories and centers had programs directly concerned with reading improvement. In addition, many studies in other subject or interest areas were indirectly concerned with reading skills and interests. For example, reading improvement was a central goal of most projects to improve the education of disadvantaged and minority groups.

Education of Disadvantaged and Minority Groups

Disadvantaged and minority groups were directly or indirectly the beneficiaries of many of the research activities supported in fiscal year 1969. About 11 percent of total obligations had the education of minorities as a major focus, and numerous other projects and programs served minorities through attention to individual differences or educational needs of inner-city and rural populations. Some studies also were related to cultural conflicts among certain groups, influences of socioeconomic conditions upon these groups, and the educational and social differences of such groups.

In a conflict of cultures study, the New School for Social Research (New York) concluded that parents of lower class students, no less than their teachers, stressed the importance of education, and that the unsuccessful lower class students could be distinguished by a lack of social competency rather than a sense of conflict with middle class culture. The subjects of this study were lower class pupils, mostly black or Puerto Rican, attending public schools in New York City or Baltimore, and a control group of white middle class students attending private schools in New York City.

A sample test and questionnaire for comparing disadvantaged with advantaged student groups was prepared by the Educational Testing Service, and how parental expectations of educational plans affected white and nonwhite pupils was the subject of a Florida State University project. Both the Stanford and the Johns Hopkins Centers had major programs concerned with cultural and economic differences. The Hopkins center used a national survey to obtain retrospective information about the educational attainment, military service, family, migration, occupation, and income of white and Negro Americans in order to describe changes which occur in an individual's life, following age 16.

Communication problems of minority groups received attention in numerous studies on basic skills and in some special projects as well. For example, in the final report of a study of social dialects in Detroit, Michigan State University points out some widely held but fallacious notions about the dialects of disadvantaged children and includes a lengthy discussion of the desirability of teaching children to switch dialects at appropriate times. The speech of Negro high school students was the subject of a project at LeMoyne College, Memphis, Tenn. Also, an Illinois Institute of Technology project on language resources for teachers of the disadvantaged had a section on language differences that account for usages frequently condemned without being understood.

A project at Tufts University studied how the social composition of schools was related to scholastic achievement, and the University of Delaware studied characteristics of Negro and white high school students prior to desegregation. In a study of citizen support for educational innovations for the culturally deprived, the University of Oregon found that citizens are far ahead of school systems in concern for education of the disadvantaged.

Improvement in educational opportunities for Indians was the goal of several projects, varying in size. The University of Kansas completed studies of rural Indian education in northeastern Oklahoma and of public education on a Minnesota Chippewa reservation, and Ohio State University finished a survey of the literature on the education of American Indians. The comprehensive national study of American Indian education, started in February 1968 at the University of Chicago, is scheduled for completion by the end of 1970. It will describe the status of Indian education based on existing reports and data from the Bureau of Indian Affairs; summarize research on Indian education; and report data from State departments of education. The study will also give the results of an intensive study of pupils and their families in 32 communities representing the major tribal groups and various types of schools—public, Bureau of Indian Affairs, mission, boarding, segregated Indian, and mixed white and Indian schools.

In related work, the Southwestern Cooperative Education Laboratory (Albuquerque, N. Mex.) has been identifying research and development needs of American Indians and Mexican-Americans. The objective is to identify 20 to 25 major educational problems facing these minority groups in order to focus future research and development activities on effective education for Indians and Mexican-Americans.

The following are some of the ongoing projects that studied educational and social advances of student groups: History of the education of deprived Negro children (Washington University); factors contributing to adjustment and achievement in racially desegrated public schools (University of California, Riverside); desegration effects in selected public schools in Oakland, Calif. (Dumbarton Research Council); effects of possible financial support for talented students from severely disadvantaged backgrounds (Oberlin College); achievement and life styles of an old order Amish community (Temple University); comparison of teaching careers of teachers from Bureau of Indian Affairs schools and similar public schools (University of Oklahoma); and effects of school integration by removing children to more racially balanced schools and a study to develop models of school integration in the South and the urban North (Harvard University).

Handicapped Children Research and Demonstrations

Specific support of handicapped children research and demonstrations is authorized by Public Law 88-164, as amended. Obligations totaled almost $13.6 million for fiscal year 1969. Of this, more than $3.3 million was used to support 14 Instructional Materials Centers, $1.98 million was used for research and development center activities, and the remaining $8.3 million was used for a variety of other activities to improve the education of handicapped children, as indicated in the following tabulation.

Area of emphasis	Amount (in millions)
Instructional Materials Centers	$3.304
R&D center-type activities	1.984
Multiple areas	3.610
Mentally retarded	1.493
Hearing impaired	.936
Visually handicapped	.750
Speech/hearing handicapped	.682
Emotionally disturbed	.648
Crippled/other health impaired	.186
Total	$13.594

In addition, $1.15 million from the authorization for the Media Services and Captioned Films Program went for research and demonstrations to benefit the handicapped of all ages.

From the appropriation for research on education of handicapped children, 128 awards were made to support new or continuation activities. From the appropriation for the Media Services and Captioned Films Program, 18 research and training awards were made.

The Instructional Materials Center (IMC) network, designed to become a permanent organization that would be locally controlled and eventually locally funded, is a federation of 14 regional centers and other satellites linked to a central group, the Council for Exceptional Children and an ERIC Clearinghouse on Exceptional Children. The service orientation of these centers was discussed earlier in this report. IMC's are funded through the University of Southern California, Los Angeles; Colorado State College, Greeley; George Washington University, Washington, D.C.; University of South Florida, Tampa; Office of Public Instruction, Springfield, Ill.; University of Kansas, Lawrence; University of Kentucky, Lexington; American Printing House for the Blind, Louisville; Boston University; Michigan State University, East Lansing; New York State Education Department, Albany; University of Oregon, Eugene; University of Texas, Austin; and University of Wisconsin, Madison.

Although the IMC's are still somewhat more service oriented than research oriented, they also have developed many innovative research programs. The informational exchange has been improved, new materials have been developed, materials evaluated, personnel exchanged, and numerous cooperative ventures undertaken. The journal *Teaching Exceptional Children,* published by the Council for Exceptional Children, is a joint product of the CEC Information Center and the IMC network.

Research and development center-type activities included continuation support at Columbia University Teachers College and new support for centers at Indiana University and the University of Minnesota. (See mission and accomplishments, page 65.) Support was also provided to the Coordination Center of the National Laboratory on Early Childhood Education to establish a component center on early education of the handicapped, beginning in fiscal year 1970.

Multiple areas.—Many of the supported activities were concerned with problems common to multiple areas of handicap. For example, the University of Minnesota was concluding a project on educational and behavioral sequels of prenatal conditions. Syracuse University was developing a clinical examination for children with severe multiple disabilities, and Pennsylvania State University worked on a computer-assisted program to identify and diagnose handicapping conditions. The Board of Education of the Detroit City School District received support for producing and evaluating individualized curriculums for the handicapped.

A study to develop a preschool center for the handicapped was completed at Southern Connecticut State College and an experimental home teaching program for preschool deaf-blind children was the subject of a San Francisco State College Project. The City University of New York received support to develop a regional learning center for the handicapped in upper Manhattan, and three awards were made to develop additional resource center capabilities (Iowa State Department of Public Instruction, New Mexico State University, and University of Oregon).

Criteria for assessing physical skill programs for trainable multiple handicapped were being studied by Los Angeles Unified School District. The Council for Exceptional Children (Washington, D.C.) received support to study the physical environment in special education, develop a computerized legislative information clearinghouse for the handicapped, and plan a pan-American conference. The Cybernetics Research Institute (Washington, D. C.) continued its work on man-machine communications for disabled persons.

Training projects included a demonstration teacher training program for the handicapped (Children's Hospital, Washington, D. C.); an inservice training program for evaluating special programs (University of Nebraska); and a survey of manpower needs for teaching the handicapped (Operations Research, Inc., Silver Spring, Md.). The outcomes of handicapped children's programs were investigated by the University of Texas, and State-administered programs were evaluated by the University of Massachusetts. Support was given to the University of Oregon Medical School to study the causes of reading disability and their relation to other abnormalities.

Mentally retarded.—A large segment of the investment in specific areas went for studies related to the mentally retarded. Studies concerned with learning included cognitive development of children with learning deficits (Michigan State University), effects of success experiences in class work (Indiana University), learning of children with brain damage (Yeshiva University), and problems of the retarded in inner-city elementary schools (Richmond, Calif. Unified School District).

Curriculum-related studies for the mentally retarded included a center for social learning (Yeshiva University), a mathematics curriculum (University of Wisconsin), life science materials for adolescents (University of Colorado), a vocational program (Muskegon (Mich.) Area Intermediate School District), programs for rural adolescents (Eastern Montana College, Billings), and a research curriculum for trainable mentally retarded students (St. Louis University).

The Kentucky Association for the Retarded (Frankfort) developed a mobile recreation and physical education unit. Millersville State College (Pa.) compared driver and highway safety variables between educable mentally retarded and normal high school age students, and the University of California Physical Education Department studied the effects of body movements upon the abilities of the retarded.

Subjects of training projects included inservice demonstration and dissemination practices for special classes (University of Iowa, Des Moines); intensive training for educating the educable mentally retarded (Palo Alto Medical Research Foundation), a parent training program for managing mentally retarded children (Utah State University, Logan), methods of cataloging equipment for the handicapped (USR Systems Corporation, Burlingame, Calif.), programed language training for diagnosing remediation (George Peabody College), and research training in aspects of lexical and syntactic development (Texas Research Institute of Mental Science, Houston).

Other activities to improve education of retarded children included the development of a day program for preschool mentally retarded (Bennington County, Vt., Day School), and a study of role-taking behavior of the mentally retarded (Yeshiva University). New York

University received support to study relationships among descriptive scales and achievement tests for the mentally retarded, and the University of Washington, to investigate procedures for teaching mentally retarded disadvantaged children.

Hearing impaired.—Research projects designed to help those with hearing impairments included a project with the University of Tennessee to test the effectiveness of low-frequency amplification and filtered speech for preschool deaf children. A University of Arizona project studied the effects of auditory stimuli in sedated subjects, and Campton City (Calif.) Schools studied the effectiveness of the initial teaching alphabet with 3-, 4-, and 5-year-old deaf and hard of hearing children. Catholic University researchers developed a thinking laboratory for deaf children, and a University of Kansas project demonstrated home training for parents of preschool deaf children. Syntactic structures in the language of deaf children were described and developed at the University of Illinois, and the Lexington School for the Deaf (New York City) studied the deaf child's knowledge of words. A model reporting system on hearing impairment and an annual census of hearing-impaired children were projects of Gallaudet College (Washington, D.C.); another project there was enlarging the sign language for teaching the deaf.

Projects to improve vocational education of the deaf were supported at Delgado College (New Orleans), St. Paul Technical Vocational Institute (Minnesota), The University of Pittsburgh, and Seattle Community College.

A film supplement to educational theater programs for the deaf and a training school for deaf theater personnel were projects with the Eugene O'Neill Memorial Theater (Waterford, Conn.).

Much of the research and training supported out of authorizations for the Media Services and Captioned Films Program was concerned with programs and materials for those with hearing impairments, although media services have now been broadened to include handicaps other than deafness.

Speech and hearing handicapped.—Language problems frequently are related to hearing and other handicaps. In fiscal year 1969, the American Speech and Hearing Association (Bethesda, Md.) received support to demonstrate the quality and quantity of service for speech, hearing, and language handicapped children.

Studies related to preschool children with speech or hearing difficulties were carried out by the Cincinnati Speech and Hearing Center and by Vanderbilt University, while studies related to school-age children with these problems were carried out by the University of Southern California, University of Chicago, and Kent State University. Identification and therapy were being investigated by the State University of Iowa and the University of Pittsburgh, and professional preparation in speech pathology and audiology was the subject of a conference funded through the American Speech and Hearing Association (Washington, D. C.).

The effect of videotape self-confrontation was under investigation by the University of Denver. Other studies included language acquisition in a dysphasic center (Monterey, Calif., Institute for Speech and Hearing), and language behavior (University of Michigan). Gallaudet College (Washington, D. C.) carried out a project on hearing aids.

Visually handicapped.—Projects for the blind were designed to produce better reading aids, improve reading materials, and help blind students vocationally. Bio-Dynamics, Inc. (Cambridge, Mass.) received support to develop a system which places braille on magnetic tape. These tapes can be reproduced quickly and inexpensively, sent through the mails easily and cheaply, and even transmitted over telephone lines if a child is in a hurry. A set of braille books 6 feet high can be reduced to a single 6-inch reel of tape, thereby eliminating storage problems encountered with materials for the blind.

Stanford University received continuation support to develop an improved system of reading by touch, and the National Accreditation Council (New York City) to develop standards and evaluation criteria for producing reading materials used by the blind and visually handicapped.

Other projects in this general area included the University of Michigan's development of programs for blind infants and young children and West Virginia University's efforts to improve vocational aid for those with visual handicaps.

Emotionally disturbed.—Research is making considerable progress in identifying and treating children whose learning is handicapped because they are emotionally disturbed. Support was provided to the University of Oregon for a project on identification and treatment of social emotional problems, and to Vanderbilt University for developing behavior dimensions for emotionally disturbed children. Temple University was studying behaviorally disordered children in the public school setting, and the University of Minnesota was investigating crisis intervention in secondary schools. George Peabody College received support to evaluate a program for reeducating disturbed children, comparing levels achieved by treated and untreated children.

Other studies included functional analysis of behavior by teachers (University of Washington), and evaluation of teacher training in managing social and emotional problems (American Institute for Research, Pittsburgh).

Crippled and other health impaired.—In fiscal year 1969, Louisiana State University received support for a multidisciplinary analysis of brain dysfunction in elementary children. Projects related to education of children with cerebral palsy were being carried out at Vanderbilt University and at Wisconsin State University, Eau Claire. Other research related to the education of children who were crippled or had other health impairments included Purdue University's development of motion picture tests to measure perceptual abilities in children.

Educational needs of children with physical or health impairments also were treated in many of the studies with primary focus on other kinds of handicap and in some studies on individualizing learning, depending upon the kind and degree of impairment.

Uses of Television and Other Media

The Children's Television Workshop is a bold experiment in the use of television as an educational and social medium. The workshop, started in 1968 by National Educational Television (New York), with public and private funds, seeks to bring educational material in an entertainment format to preschoolers, an audience which often spends much of each day before a television set.

The educational material being created, tested, and produced expressly for young children takes into account their interests, attention span, and learning techniques. From the project's beginning, staff who have been developing the series of 1-hour shows were aware that about two-thirds of a person's intellectual development occurs in the critical years before he even begins his formal education. They realized also that, by the age of 5 or 6, many slum children trail so far behind middle class children that, from an educational point of view, they are already remedial cases. These points, made by Benjamin Bloom in his *Stability and Change in Human Characteristics* and Maya Pines in *Revolution in Learning,* have been substantiated over and over in recent research. Consequently, early program development was designed to strengthen the intellectural diet of disadvantaged children and motivate them toward successful learning experiences.

During fiscal years 1968 and 1969, Carnegie Corporation, the Ford Foundation, the Office of Education, and several other Government agencies provided all together about $8 million to produce the basic ingredients for 130 daily hour-long shows to make up the season for large-scale telecast beginning in the fall of 1969. Cooperative Research support accounted for about $1 million in each of these years. To estimate the cost of this initial production relative to the costs of other kinds of preschool programs, it is necessary to take into account that, in the United States, there are 12 million children age 3, 4, and 5 for whom there are virtually no regular preschool programs and that at least half of the school districts are still without kindergartens. In terms of per pupil cost, the investment in this program is small indeed, compared to that for inschool programs. For example, the year-round phase of Head Start during 1967 cost $210 million to reach 215,000 children. Furthermore, although there is a shortage of classroom space, there is no recognized shortage in television sets and reception is free to anyone tuning in the program. Indeed, more homes have television than have bathrooms or telephones; estimates show that sets are available in 90 percent of the households with less than $5,000 annual income. It is expected also that parents, observing the learning by their preschoolers, will develop increased interest in the later formal education of their children.

The Children's Television Workshop series, known as *Sesame Street,* uses live actors for continuity, plus films, cartoon-like animation, and "television advertising" which provides repetition in learning numbers, letters, ideas, and concepts. Pace, humor, and repetition are designed to give children pleasure and pride in learning.

At the end of the fiscal year, preliminary testing of the *Sesame Street* segments forecast enthusiastic reception by both children and their parents. However, there were still some unanswered questions, not about the quality of the show but about its general accessibility to some of the children most in need of it. For example, in those metropolitan areas where educational television is confined primarily to UHF channels, to what extent is equipment with UHF-receiving capabilities generally available in low-income homes and in day-care centers and public school kindergartens? And how accessible will the program be in those isolated areas which depend upon cable transmission even for VHF programing? If the $8 million invested in the Children's Television Workshop from all sources thus far could reach the minds of all or even most of the 12 million preschoolers between age 3 and 5, it could mark a phenomenal advance in educational opportunities. Reaching even a substantial portion of these youngsters might be economically praiseworthy. But, if the program is to have its anticipated impact on the learning enthusiasm of underprivileged or isolated young children, as well as upon those who are more fortunately situated, some social and technological hurdles may still be important factors in determining the total listening and participating audience.

Numerous other media and communications projects received Cooperative Research support during fiscal year 1969. Among them were a study of guidelines for using audiovisual materials in elementary and secondary schools (Indiana University), and an inservice training program for new media for elementary school staff (Macalester College). Media effects on student learning methods and teacher role were reported in several projects. At Stanford University, computer-assisted instruction in reading and arithmetic curriculums developed for culturally deprived children were tested in schools in California, Mississippi, Tennessee, and Kentucky. Another project to evaluate student performance on computer-assisted lesson materials was in progress at the University of Illinois.

Researchers at the University of Southern California found that, for learning cognitive information, the motion picture was far superior to still pictures or sequenced still pictures simulating action. However, concept learning seemed less influenced by the mode of presentation than by the learning of specific facts or serial ordering. A planning guide for *Instructional Television Facilities* (OE-34043), completed under a contract with Brooks Research Foundation, Santa Barbara, Calif., was published by the Bureau of Research during the year.

Other examples of media research are included in later sections dealing with content areas and improvement of administrative and library services.

CURRICULUM IMPROVEMENT EFFORTS

The communication and knowledge revolutions and advances in learning and teaching theory have forced changes in student-teacher relationships and a division of labor realinement between classrooms and libraries and between texts and other resource materials. All of these have brought demands for research and development to revise curriculum content and methods in nearly every subject and at every educational level. A large segment of Cooperative Research funds were invested in curriculum-related projects during fiscal year 1969. Other curriculum investments came primarily from appropriations for vocational education research and for foreign language research.

Language Arts and Related Areas

Language arts curriculum projects fell roughly into two groups: those seeking to upgrade communication skills of all children and those seeking to improve the skills of bilingual children and those with nonstandard dialects. The Department of Public Instruction of the State of Wisconsin produced an English language arts curriculum for grades K-12, established demonstration centers, and involved nearly 15,000 teachers, administrators, and consultants in the project before it was ready for widespread dissemination and adoption. In the area of language learning, a New York Medical College project developed a standardized technique for measuring verbal ability in young children.

At the University of Georgia, a curriculum project has been developing written composition materials for kindergarten and elementary schools. A University of California project has been focused on verbal skills development for culturally deprived children. The Illinois Institute of Technology received support for a project to provide information needed by teachers of nonstandard speakers of English, mostly inner-city Negro students; the resulting materials will be distributed by the National Council of Teachers of English. Educational Systems Corporation (Washington, D.C.) carried out surveys of language teaching methods and materials, personnel training, and student assessment in the field of nonstandard dialects of English, and the Center for Applied Linguistics completed a study of training programs in nonstandard English. Attention to language arts was also a factor in many of the projects to improve education of minority groups.

Mathematics, Science, and Social Studies

Mathematics projects included a feasibility study at the University of Chicago for a basic new school arithmetic, and a study by the Massachusetts Department of Education on the teaching of mathematics with a time-shared computer. One Stanford University project focused on an automated arithmetic curriculum for culturally deprived children and another studied the development of mathematics concepts in children. Columbia University began to build a modern secondary school mathematics curriculum which combines the several branches of traditional mathematics and presents unified general concepts and structures in a framework now being used in many foreign countries.

A University of California project studied the differences in children's mathematical competency after using different instructional programs for 3 years. Funds were used by Boston University for developing a diagnostic inventory to differentiate levels of understanding of plane geometric figures, and by the University of Maryland for developing an inservice mathematics program for elementary teachers.

Science projects included one completed by the University of Miami to promote scientific careers for gifted junior high school students. In this project, the National Science Foundation supported the operational activities and the Office of Education funded the evaluation. In other projects, Colorado State University analyzed a typical instructional unit in junior high school science, and the National Science Teachers Association identified certain conceptual schemes that could be used in science curriculums. A University of Virginia project used programed materials and student-performed experiments in upper elementary science curriculums.

Two ongoing curriculum development programs showed promise of having special impact upon science teaching. Florida State University received fiscal year 1969 support to develop an intermediate science curriculum in a 3-year sequence for grades 7, 8, and 9, using self-pacing materials. Continuing and enlarging an earlier pilot project, New York University was developing a conceptually oriented program for elementary science for grades K-6, organized around five broad scientific themes.

Social science projects were planned around three major areas: (1) the theoretical bases for organizing knowledge and presenting it through course materials, (2) the preparation of materials dealing with subject matter fields not existing before, and (3) new combinations of knowledge traditionally taught.

The Minnesota social studies curriculum is designed for pupils of various ability levels and provides increased emphasis on the non-Western world, behavioral sciences, pupil inquiry, and study of value conflicts.

A University of Georgia project developed an anthropology curriculum for grades 1-7, and one at Harvard provided curriculum materials on public issues in law and social science, using fiction and nonfiction cases with accompanying sets of problems, questions, and means to evaluate each case. The objective is to help students analyze, rather than criticize, social conflicts.

The University of Texas developed teaching guides and materials on Latin America for use in grades 1-12, and Tufts College developed additional materials on race and culture in American life.

New combinations of knowledge were studied in a Louisiana State Department of Education project that resulted in teaching guides and materials on world, North American, and Louisiana geography for use in grades 1-12.

Understandings of differences within our domestic culture often are related to understandings of foreign cultures. In fiscal year 1969, the Foreign Policy Association was completing the last part of a survey of the attitudes of American educators and social scientists toward the international education of elementary and secondary school pupils. Findings provide a rationale for international affairs education, a list of objectives, and an outline of implications for research, curriculum development, and teacher education.

At the University of Wyoming, a conservation education project was being concluded. An experimental sequence of integrated conservation units had been developed and tested for teachers and students in grades 1 9.

Arts and Humanities

During fiscal year 1969, approximately $1.8 million in Cooperative Research funds was invested in new and continuation arts and humanities research. About a third of this was applied to laboratory theater projects in New Orleans, Los Angeles, and Providence (R. I.) and related activities at the educational laboratory at St. Ann, Mo. Another third was invested in music activities, including several large curriculum development projects. Other areas receiving substantial amounts of support included esthetic education, art education, and interdisciplinary approaches in the humanities.

Arts and humanities priority areas during fiscal year 1969 included perceptual learning, evaluation strategies, and the use of the arts in educating disadvantaged students and others.

Five pilot studies were funded to help measure affective responses in esthetic education. More specifically, these projects will identify an evaluative structure of responses, evaluate the affective dimensions of art object meanings, develop music discrimination tests, assess role induction and involvement in drama, and assess esthetic sensitivity.

Beginning with the OE-sponsored Gaithersburg Conference in November 1966 on "The Role of the Arts in Meeting the Social and Educational Needs of the

Disadvantaged," the Arts and Humanities Program has placed increasing emphasis on stimulating worthwhile projects in this area. In fiscal year 1969, the Brooks Foundation (Santa Barbara) completed a national survey of performing arts programs for the disadvantaged and reported the location and some of the experiences of such programs.

Also in 1969, the American Institutes for Research (Palo Alto) began evaluating how films can improve self-image in minority group children. In phase I of this effort, AIR examined the elements, dissemination pattern, and audience effects induced by the film *Frederick Douglass.* Applying the findings in phase II, Robert Saudek Associates will produce a film specifically designed to improve self-image among minority students. In phase III, the film's influence on student image and teacher strategies will be assessed.

At Los Angeles State College, a study disproved the assumption that art education experiences are profitable to the disadvantaged simply because of their concrete nonverbal nature. It found, instead, that the key to bringing about behavioral changes is the art teacher and not art, per se. To be effective with economically impoverished and socially disadvantaged students, the teacher needs a thorough understanding of his subject and of his students as well, plus the competencies and materials required to utilize such knowledge.

In the area of the arts in general education, a project at Howard University (Washington, D.C.) has been developing a program which demonstrates the power of music for teaching the culture and life style of other countries. This 30-month effort to develop and evaluate a 1-year general education course in African music for college and senior high school students started with a curriculum outline for the course, a collection of musical instruments and audiovisual materials, and an extensive bibliography on African music. A 2-week workshop was held in June 1969 for college and high school teachers concerned with African music and for teachers from the cooperating U. S. and African institutions that will use and evaluate the course in the next school year. The course should be available for general distribution in the fall of 1970.

In its project on "Development of Validated Museum Exhibits," the Boston Children's Museum demonstrated the educational value of a series of sequential exhibits in a museum setting. Relying on the evaluation techniques of modern science to improve exhibit effectiveness, the project demonstrated how contemporary learning research and exhibit design techniques can make displays both exciting and instructive.

During fiscal year 1969, a comprehensive analysis of museum activities in relation to education was prepared for publication of baseline data from a nationwide survey. The study had been undertaken by the Arts and Humanities Program staff, working cooperatively with the Smithsonian Institution and the American Association of Museums. The object was to ascertain the nature and extent of museum participation in education and report on the condition and urgent needs of America's museums. As an outgrowth of its involvement, the Smithsonian Institution created the Anacostia (Washington, D.C.) Neighborhood Museum, which attracted national attention as a learning facility in a ghetto area. The University of Wisconsin (Madison) followed up a different kind of interest in museums in fiscal year 1969 by studying the application of programed learning procedures in a museum environment.

Foreign Languages and Area Studies

Support for research on foreign languages and area studies came primarily from appropriations administered under the guidelines of section 602, title VI, of the National Defense Education Act. Unlike previous years, the fiscal year 1969 appropriation was made under Cooperative Research. Of a total of $2.75 million, in fiscal year 1969, $1.4 million was obligated in support of 31 new projects, $1 million for continuation of 30 ongoing projects, including the ERIC Clearinghouses for Linguistics and the Teaching of Foreign Languages, and $.3 million for research conducted at NDEA Language and Area Centers.

Support under section 602 was continued under three major categories authorized by the act, that is, studies and surveys to determine the need for increased or improved instruction in modern foreign languages and related areas, research in more effective methods of teaching such languages, and the development of specialized text materials for the study or the teaching of such languages and related area subjects.

Support was provided for the Center for Applied Linguistics, Washington, D.C., to convene a work conference to outline criteria and procedures for a comprehensive description of the languages of the world, and to produce concrete recommendations regarding the need for, and the preparation of, bilingual dictionaries. The Social Sciences Research Council and the Association for Asian Studies received funds for a review of language and area study programs at American universities and the relationship of area-oriented professional organizations and their individual members to these programs. The American Association of State Colleges and Universities, Washington, D. C., began a survey of international education in State colleges and universities, and the Center for Research in Language and Language Behavior, University of Michigan, was awarded a contract for several projects involving basic and applied research in psycholinguistics and foreign language learning processes.

Conferences which received support were concerned with the integration of Spanish-speaking minorities into American society, the cooperation of Africanists in Afro-American programs, and the assessment of present and future needs for Japanese and Chinese language study by American students in Tokyo and Taiwan.

Various research projects were supported to improve methods of foreign language instruction. For example, at the University of California, Santa Barbara, the phonetic characteristics of certain foreign languages were investigated for comparison with those in English. At Georgetown University, research was conducted on the effect of oral and graphic stimuli on the memorization and pronunciation of basic dialogs.

Textual materials under contract in fiscal year 1969 included a student's reference grammar of Hindi-Urdu; guides to Chinese dialects; an introduction to literary Chinese that provides a transition from the spoken to the literary language; a basic course for African languages in Dakar Wolof and a dictionary of Ibibio; an analysis and basic lesson units for Aymara, an American-Indian language spoken primarily in Bolivia; and other materials. By the close of fiscal year 1969, research and development supported by this program has resulted in improved teaching techniques and sets of instructional materials in about 140 of the uncommonly taught languages.

Research carried on at the area centers benefiting from the $.3 million from the language research authorization included projects for development of instructional texts and materials, the compilation of bibliographical and other reference materials, and several projects dealing with Afro-American studies and Spanish-speaking minorities.

During fiscal year 1969, Cooperative Research support was continued for 15 comparative education research studies. Among final reports received during the year, one on Communist China gives translations from elementary school readers to show how Communist values are generated.

Cooperative Research support also was provided for the University of Rochester to complete a project using programed foreign language courses in secondary schools with specially trained teachers, and to the University of Washington to finish a project that defined achievement levels for speaking and auditory comprehension in Spanish. Ongoing projects receiving support from Cooperative Research included a study of the audiolingual instruction needed by sixth-grade pupils before beginning their first-year Spanish (San Diego, Calif. Unified School District), and a computer-assisted instruction project for second-year Russian (Stanford University).

Certain awards for research and study abroad under the Fulbright-Hays and the Agricultural Trade Development and Assistance Acts have definite implications for improving instruction in modern foreign languages. During fiscal year 1969, support was provided for individual overseas research, study, and travel by about 150 doctoral degree candidates preparing for careers as college or university teachers, and also for about 75 other college and secondary teachers and supervisors. American institutions also received awards to conduct group projects overseas for undergraduate and graduate students and for high school and college teachers. As individuals or as members of groups, participants were enabled to carry on research and study in such places as Poland, Italy, Yugoslavia, India, Indonesia, the Philippines, Kenya, Ghana, Ecuador, and British Honduras. Excess foreign currencies under the Agricultural Trade Development and Assistance Act (Public Law 83-480) were sometimes used in those countries where they were available.

Vocational Education

Activities carried out under authorizations for vocational education research and training (Public Law 88-210, as amended) extend preparation for current and anticipated employment opportunities, making them responsive to needs, interests, and abilities of students, particularly those who have socioeconomic, educational, and other handicaps which hinder their success in regular vocational education programs. In addition, other projects with vocational elements were funded under Cooperative Research.

Current demands for school systems to respond to emerging vocational and technical education curriculum needs have brought forth a variety of actions that range from simple expediencies to organized programs in highly specialized areas. Toward the end of the fiscal year 1969, support was provided to the American Vocational Association for a national study of accreditation of vocational and technical education. The study was designed to develop basic criteria common to programs at all levels, formulate accreditation models, devise guidelines for self-evaluation and accreditation, field test the accreditation procedures, and establish channels for implementing the adjusted procedures to improve program substance and quality.

One major and promising response to the Vocational Education Amendments of 1968 is a group of activities concerned with "new careers," particularly in human and public service fields. Job functions are being redefined to identify paraprofessional roles with career advancement opportunities, and programs are being designed to facilitate career mobility. Effective training for these paraprofessionals can help provide urgently needed services to the community, alleviate acute shortages in professional manpower, and provide satisfying careers for large numbers of persons, including the disadvantaged, undereducated, and various unemployed and underemployed.

To provide for new careers created by emerging technology, the Technical Education Research Center, Inc. *(Cambridge, Mass.,* and Waco, Texas) has been coordinating curriculum development projects in electromechanical and biomedical equipment and in nuclear medical and electro-optical technology. New York University continued its investigation of careers in human services, and the Institute for Local Self-Government (Berkeley) studied municipality needs for vocational-technical career candidates. Specific program development was carried out in recreation services for the disabled (New York University) and in administration of justice (New Careers Development Organization, Oakland, Calif.). In keeping with emerging personnel changes in the schools, Wayne County Intermediate School District (Detroit) received support to design new careers in educational services; Bank Street College of Education (New York City), to develop materials for teamwork by auxiliary and professional personnel; and the University of Oregon, to analyze comparative costs and benefits of nonprofessional aide programs.

The U. S. Public Health Service has forecast that an additional one million workers will be needed in allied health fields by 1975. To help meet this need, the University of California, Los Angeles, and a consortium of southern California community colleges and hospitals in 1968 started a cooperative project to develop instructional materials needed to train new workers and upgrade the skills of those already in the profession. Procedural steps include job analyses of 18 health occupation areas and development of multimedia instructional packages. Materials are further tested, refined, and prepared for wide dissemination and use.

Increased mechanization and complex construction have brought the need for formal training in some professions which were formerly picked up "on the job." Concrete technology is one of the areas so affected. A curriculum for workers in this field is being developed and evaluated by the Portland Cement Association, National Ready Mixed Concrete Association, and American Concrete Institute. Materials are to be provided for high school vocational courses, adult continuation programs, apprentice training and upgrading, and intensive specialization where appropriate.

Although students in areas of population density often have access to specialized career training, those in sparsely settled areas are not so fortunate. The Western States Small Schools Project (Salt Lake City) is developing a model curriculum, course content, and materials appropriate for use in isolated, small high schools where population density and transportation factors are not conducive to specialized programs. Through individualized instruction, the materials from this project will help integrate general education, systematic career selection and preparation, and occupational experience.

Individualization of vocational instruction has also received the attention of educators in more populous areas to facilitate self-directed learning, individual pacing, and varied learning tracks. For example, Willingboro (N. J.) Township Board of Education received 1969 support for a summer institute to help teachers learn how to develop and implement individualized instructional packages for vocational students.

Investigators from three institutions have joined their efforts to design and test a home economics program to prepare disadvantaged students for dual roles as homemaker and wage earner. Purdue University took responsibility for developing workshop materials; Cornell, for refining and disseminating the materials and designing evaluative instruments; and Ohio State University for analyzing collected research data.

In 1969, the Aerospace Education Foundation was investigating the feasibility of adapting three Air Force instructional systems for use in civilian education. Segments to be tested in Utah schools include medical service specialists, electronic principles, and aircraft mechanics. It is interesting to note that materials developed earlier, with 1965 research support, led to a complete revision of the general aviation mechanics training program by the Federal Aviation Agency and have been adopted in more than 60 schools throughout the country.

Emerging new careers have brought increased interest in vocational guidance. Newton, Mass., public schools have been field testing a computer-based guidance system developed by Harvard and the New England Education Data Systems. Individualized training in decisionmaking is facilitated by simulations and games which use data banks containing facts about occupations, military service options, high school and college course choices, and career attributes. The student generates alternatives, sets up criteria for choosing, compares specific courses of action, reviews his reasoning, and identifies future choices likely to be linked with the current one.

Another approach to vocational guidance is being studied by the American Institutes for Research, Pittsburgh. This project is testing the use of computer information developed in Project Talent in helping ninth-grade students retrieve and explore information about various vocations. Ten such studies are described in *Computer-Based Vocational Guidance Systems* (OE-25053), published by the Bureau of Research in 1969.

Johns Hopkins University received Cooperative Research support to study the forms and degrees of student involvement in the decisionmaking process. Although not strictly vocational, this study should help unions and other vocational groups analyze how decision participation affects change initiation.

The $1.98 million invested in vocational education personnel development activities represents cooperative application of funds available through the Bureau of Research, Bureau of Educational Personnel Development, and Bureau of Adult, Vocational, and Technical Education. More than $1 million was used for 31 short-term training institutes to upgrade the qualifications of vocational and technical education leaders and thereby provide a multiplier effect in improving efficiency of all personnel. The major focus of these programs in fiscal year 1969 was the occupational needs of youth and adults living in the inner city and in isolated rural areas.

A somewhat smaller amount was invested in other research and development activities related to personnel. Projects included such areas as improving the teacher's role in an individualized classroom, strengthening personnel and programs in junior colleges, developing minority business and management capabilities, and improving accreditation.

Continuous broad-scale research and development in vocational education was in progress during 1969 at two centers, one with an affiliated ERIC clearinghouse at Ohio State University, Columbus, and the other at North Carolina State University, Raleigh. (See page 63).) In addition, vocational Research Coordinating Units were operating in 46 States.

SCHOOL SERVICES AND ADMINISTRATION

The efficiency of school services and administration has a powerful effect upon the quality of learning that takes place in the school. Teaching and related instructional activities that involve students are the most important school service. However, what the teacher is able to accomplish often depends upon administrative arrangements under which the school operates, and physical resources available for library and other activities.

Teacher Education

The Elementary Teacher Education Development Program represents a strong effort to improve teacher education by applying systematic program planning to that field. The first phase consisted of developmental projects to design models that could serve as teacher education goals, determine alternative components for achieving these objectives, and define management control systems which could function in teacher education. From among more than 75 entries, models were selected for development support in phase I, and ten were available for feasibility studies in phase II. These models were from Syracuse University, Teachers College of Columbia University, University of Pittsburgh, Florida State University, Northwest Regional Educational Laboratory, University of Massachusetts, University of Georgia, Michigan State University, University of Toledo, and University of Wisconsin.[2]

The models represent the first large-scale attempts to develop comprehensive new programs of elementary teacher preparation. In the past, improvements have employed such innovations as multimedia approaches, simulated observations, improved subject matter preparation, and new courses in human relations, but these changes have been piecemeal, with new techniques and content either fitted into current operational frameworks or rejected out of hand.

The present project has permitted the rethinking of the total program of teacher education and has provided a vehicle for exploring new concepts and approaches. Each model begins by examining the present program's strengths and weaknesses for improving the interaction between a teacher and a child in the school setting.

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[2] Separate specifications for these ten models, plus *A Short Summary of Ten Model Teacher Education Programs, Systems Analysis and Learning Systems in the Development of Elementary Teacher Education Models*, and *Analytic Summaries of Specifications for Model Teacher Education Programs* have now been published and are available from the Superintendent of Documents, U.S. Government Printing Office.

Program elements which do not relate to this interaction are discarded, and only those found relevant are retained and incorporated into the new designs. While the models may seem radical departures from today's traditional programs, they are grounded in basic educational concepts and show the kinds of programs that could result from starting afresh instead of building around a patchwork that evolved from past reforms.

The 10 models envision continuous training throughout the teacher's career. The Georgia model outlines alternative entry levels as part of an educational career ladder. The Michigan State model shortens the time between the student's entry into college and his first professional responsibilities. The ComField group (the Northwest Regional Educational Laboratory) separates the education leading to a degree from the professional preparation resulting in certification. Each of the models emphasizes continuing inservice education planned in conjunction with local school districts.

The concept of the elementary teacher as a generalist who presides over a self-contained classroom is challenged in all 10 program models. Each sees the teacher emerging as one of several partners in the learning process. The Michigan State model makes provision for supporting the teacher with aides and media specialists, the latter capable of producing and selecting appropriate learning experiences. ComField envisions the teacher/manager supported by an instructional engineer and an instructional analyst.

In each of the models the teacher candidate would learn to individualize and personalize the instruction of children. The candidate himself would experience instruction in a teacher education program which allowed him to proceed at his own pace and in his own particular style of learning. The model builders accomplish this individualization by setting behavioral objectives and then designing instructional segments (modules) with alternate paths to reach these objectives. It is the student who chooses his route from among these alternate paths. The module may permit individual instruction, attendance at a lecture, interaction with groups of pupils, or a combination of these activities. Advisers help students plan their instructional course and review the evaluative feedback from the instructional segments.

In a little more than a year and a half, the Teacher Education Development Program has responded to demands for major reforms by systematic development of models for completely new approaches to meet modern needs. This has been accomplished in such a way that there now exists an enormous literature as a matrix on which alternative future program developments can proceed. For example, the 10 models include statements of objectives that have much in common in some areas of teacher performance but a wide range of differences in others. Similarly, the models include a wide range of alternative procedures but have some common elements, especially in the use of program components and modules. Recommendations vary from vigorous systems management techniques to student involvement in ad hoc management of their own programs.

Put another way, the Teacher Education Development Program has enormously increased the stock of teaching strategies for teacher education and strengthened the base for interdisciplinary program planning. The strong dissemination effort which is a natural corollary of the feasibility studies should succeed in affecting a very large segment of the teacher education programs in the United States.

During fiscal year 1969, phase II of the program was funded. More than one million dollars was spent in contracts with eight institutions to test the feasibility of the program models developed during phase I and report back their experiences for the benefit of others. Support was awarded to Florida State University, Michigan State University, Oregon College of Education, Syracuse University, University of Georgia, University of Massachusetts, University of Toledo, and University of Wisconsin. These reports will be completed in fiscal year 1970 and will help determine the direction and future funding of the Elementary Teacher Education Program.

In conjunction with these major feasibility studies by large institutions, small study grants were made to help 10 small and emerging institutions in the Southeast analyze the program models developed during phase I to see whether such programs, designed for larger institutions, may be adaptable in whole or in part to the needs and resources of smaller colleges. The institutions involved in this study were Clark College (Georgia), Florida A & M University, Jarvis Christian College (Texas), Livingston University (Alabama), Norfolk State College (Virginia), North Carolina Central University, Shaw University (North Carolina), South Carolina State College, Tennessee State University, and Xavier University (Louisiana). With the exception of Livingston University, all are attended predominantly by black students.

In addition to the bold approaches being studied in the Teacher Education Development Program, various other efforts to improve teaching and teacher education are being undertaken by the Stanford and University of Texas Research and Development Centers and by educational laboratories. Also, some individual projects have been seeking to improve teaching. For example, a study completed at California State College, Dominguez Hills, designed a method to help teachers refine the self-study process and thereby improve their effectiveness with students. Participants were teachers and classes of gifted students, but materials and procedures can be adapted for use in other school situations.

School Management and Finance

Various projects were carried out in the area of elementary and secondary school administration. Oregon State University studied the issues and problems of elementary school administrators as reported by school principals from 50 States. The University Council for Educational Administration, Columbus, Ohio, is studying how programs for educational administrators could be restructured and how researchers could be prepared for administrative service.

Eastern Michigan University completed a study on community support for public schools in a large metropolitan area. Findings indicated that variations in the social makeup within the metropolitan area were linked with variations in attitude toward school support. Another study, completed at the University of Chicago, concluded that schools are an important element in the politics of metropolitan areas and that teachers organizations exhibit heavy concern for social policy as well as teacher welfare. The University of Florida started a study to learn what changes in organizational structures of large metropolitan schools might be necessary to solve problems of tenure, militancy, and organizational conflicts.

The Association of School Business Officials, in conjunction with Dade County (Fla.) Schools, received support for a project designed to develop a model program planning-budgeting-evaluation system (PPBES) for determining quality education and costs. In a related area, Intech Corporation (Wilkes-Barre, Pa.) used Cooperative Research funds to work on an Education Information Technology System, designed to teach teachers in the use of computers in the classroom. Among other projects was a study by the Interprofessional Research Commission of transportable models to be used for pupil personnel services in suburban, rural, and inner-city schools.

A summary of the organization, administration, and operational patterns of State boards serving higher education was the goal of a project researched by the Association of Governing Boards of Universities and Colleges. A contract for a project with the American Association of School Administrators (Washington, D.C.) extended work towards a national Academy for School Executives to keep executives up to date on how to cope with present tensions and crises. The academy offered 13 clinics at various strategic locations during the spring and summer of 1969 and scheduled 25 fall and winter 1969 clinics on such administrative problems as student activism, militant pressure groups, racial issues, instructional technology, strikes and sanctions, urban crises, program budgeting, and public relations challenges.

Some foreign currency financed research of general interest to administrators of American schools was supported under Public Law 83-480. Funds were used in the eligible foreign countries, usually by their own nationals, for educational research of mutual concern to those countries and the United States.

In fiscal year 1969, seven educational research projects were under way in India, 16 in Israel, and two in Yugoslavia, using Public Law 480 funds. Typical subject areas under investigation were the identification of creative children from culturally deprived homes, the relationship of education to career expectations, and the education of a national minority. In addition, bibliography/translation projects, supported under funds transferred from the Office of Education to the National Science Foundation in earlier years, were underway in Burma, Ceylon, India, Israel, Pakistan, Poland, Yugoslavia, and Tunisia.

Library Research

Library research and development is authorized by Public Law 89-329, title II B. Under this authorization, the Library and Information Sciences Research Program, initiated in 1967, obligated nearly $3 million for 39 projects during fiscal year 1969. These were focused on four major topics: improving education for librarianship; organizing administrative and planning techniques; integrating services among school and public libraries; and applying technology to library activities.

One of the final reports received in fiscal year 1969 was an overview of the Library Services and Construction Act. It was prepared by the System Development Corporation, Santa Monica, Calif., and provides an analysis of the effects of Federal funds on public library service in the United States. Another report, prepared by the R and D Consultants Co., Los Altos, Calif., deals with the cost of a computerized book catalog and is directed toward administrators of academic and large public libraries.

Two publications resulted from another project with the System Development Corporation. One was *The Educational Information Center: An Introduction,* written mainly for use by staff of State and local educational agencies with little or no training in the library or information science field; and the other was a *Directory of Educational Information Centers* (OE-12042), published through the U.S. Government Printing Office and for sale by the Superintendent of Documents.

Among the projects still in progress is a study by the University of Maryland to help solve the manpower requirements of library and information services, based on understanding career and leadership roles and the status of the library and information science field. In another project, master's degree students in library science at the University of Maryland received support for an experimental library in a povery area and for the development of other innovative library programs and services. A formal college course provided the necessary background and understanding of the library's social responsibilities to the disadvantaged.

An extensive study being carried out at Leland Stanford University deals with bibliographic automation of operations in a large library. This data-management system, which includes purchasing, cataloging, and circulating functions, would improve data and information services to students, faculty, and staff and enable multiple users in various locations to search the same or different data bases concurrently.

In the area of improving education for librarianship, a University of California study was designed to determine library education needs and recommend library research and development priorities for the U. S. Office of Education and other Federal agencies. Rutgers, The State University of New Jersey, received support to study personnel in research libraries, their qualifications, and what users expect from these research personnel. The Bureau of Social Science Research, Inc., is studying the procedures used by some 50 institutions in awarding library fellowships, and the effects on early careers of the fellows. This study should provide background data for considering a federally sponsored library education program.

In the area of library organization, the University of Pennsylvania is developing systems analysis for planning, programing, and budgeting in large city and university libraries. The model system developed in the first year of the project will be tested the second year.

The sheer volume of currently available materials calls for coordination of services within and among organizations with library functions. The School District of Philadelphia has a project focused upon finding out the library needs of elementary and secondary students, and determining how the several school systems and public libraries can provide needed resources in a centralized facility. Fels Institute of the University of Pennsylvania is doing the field research for this project.

Library technology research includes documentation, network and system planning, automation, preservation of materials, storage, reprography, and development of hardware. Four major research projects are concerned with cooperative networks which facilitate the sharing of holdings and services. One of these projects assesses the general state-of-the-art among networks; the other three projects are developmental. The American Library Association (Chicago) has been studying information networks, available technology, and networking rationale as preparation for a work conference to develop a national interlibrary communications network. The New England Board of Higher Education (Cambridge, Mass.) is developing a machine form union catalog for the New England Library Information Network, with a book form union catalog that will be available to college, university, and public librarians in New England. The Washington State Library (Olympia) is constructing a decisionmaking model for the State's library network, to be used by the title III Advisory Council and the State Library Commission. Another kind of developmental research is being carried out by Auerbach Corp. (Philadelphia) to design new models of informational services for use by primary and secondary school administrators.

Four specific projects came as a result of an Office of Education solicitation for new library technique studies—microform, in particular. The American Association of Junior Colleges (Washington, D. C.) is investigating whether students, especially those in community junior colleges, accept microform collections as supplements to book collections and whether they will learn effectively from them. Valid testing must include students' assignments in several courses and programs to determine whether student use of microform collections is sufficient to bring about cost savings.

Other microform projects include development of a low-cost microfiche reader (DASA Corporation, Andover, Mass.), and determination of user needs and requirements for a system approach to microform technology (Association of Research Libraries, Washington. D. C.).

HIGHER EDUCATION RESEARCH

During fiscal year 1969, approximately $2.7 million in Cooperative Research funds was used for higher education project research. This was in addition to the sustaining support for higher education research activities in clearinghouses, centers, and laboratories.

The major goal of higher education project research was to reevaluate the goals and nature of the higher educational structure and help institutions meet the changing crises. Emphasis fell roughly into four areas:

- Developing improved curriculum approaches and instructional practices.
- Studying individual and societal needs and the solutions higher education can make to social problems, especially in urban areas.
- Organizing, developing, and sharing the limited physical and financial resources of higher educational institutions for greater productivity.
- Learning more about students, faculties, administrators, and institutions to make higher education more efficient in reaching major goals.

How newly developed and relevant curriculums can overcome the deficiencies of student groups was demonstrated in a project with the Institute for Services to Education (Washington, D. C.). It involved 3,600 students in 14 predominantly Negro colleges, using an experimental approach to a comprehensive new curriculum during the first segment of a 2-year development project. Fiscal year 1970 plans call for further curriculum development, provision for teacher training and consultant services, and evaluation of student performance and attitudes. In one phase of this project, faculties from 13 colleges and other observers studied further curriculum developments in a summer institute.

A project funded with the University of Illinois studied how student achievement might be improved through changes in college examinations; one at the University of Wisconsin was related to work orientation, college performance, and the choice of occupations. English composition was the subject for two projects, one at the Macomb County Community College, Warren, Mich., and the other, an extension of a project for college freshmen English, at the University of Northern Iowa. The University of Denver undertook a study of research methods in sociology for law students, and the U.S. National Student Association received support for a study aimed at improving undergraduate curriculums in general

The role universities can play in alleviating urban problems was the subject of several studies. One by the Bureau of Social Science Research, Inc. (Washington, D.C.) identified urban problem areas and surveyed 12 institutions most likely to be active in urban problemsolving efforts to determine how they interact with the community and what activities produce the best results. One at the University of Pittsburgh was designed to understand the nature of urban problems and how a university could relate to them. The project also sought to determine what priorities and approaches could be used by the university to coordinate its resources with those of the Government and other civic groups, not only for solving critical regional urban problems but as a model for other universities and their communities.

A Federal City College (Washington, D. C.) project was designed to find out how urban higher education institutions and community groups can interact to solve urban problems, how college-community relations can be improved, how institutions and outside organizations can be mobilized for action, and how such programs can be evaluated.

How to design and develop an information management system and provide and operate data bases was the subject of a resource-sharing project carried out with the Western Interstate Commission for Higher Education (Boulder, Colo.). This regional cooperative project followed commitments from all major institutions in 13 Western States, New York, and Illinois to accept and implement common uniform data elements and management information systems in program planning. When completed, the service would furnish comparable data on program costs by level of students, courses, and field of study for use by administrators in allocating resources and making decisions. Data element dictionaries for students, staff, and school facilities were developed and published. Subcontracts were authorized to review all the management information systems literature and develop a model. Plans were prepared for interregional links to serve as a base for reporting future planning and management data and for other cooperative networks, such as television and computer services.

Numerous projects were devoted to problems of college students and staff, administrators, and institutions. Personality differences among college students in different educational atmospheres were studied by the University of California; the sociological complications of public support of higher education, by the Bureau of Social Science Research, Inc.; academic building systems, by the University of California; methods of analyzing and assigning building space, by the American Association of Collegiate Registrars and Admissions Officers; the impact of research on the utilization of media for educational purposes, by the Institute for

Educational Development; use of computers, by the University of Michigan; and development of a computer system to score and analyze tests, by the University of Chicago.[3]

Recent events on some of the major campuses reemphasize the need for national policies and strategies among higher education institutions to guide positive growth and avoid having to fight local pressure battles individually. Consequently, Cooperative Research support was also provided to the Academy for Educational Development, Inc. (Washington, D.C.) to establish a national planning congress for higher education.

DISSEMINATION AND USE OF RESEARCH RESULTS

Support for disseminating the results of education research was first authorized in 1965 amendments to Cooperative Research. Since that time, provision has been made to include dissemination in supported projects and programs. The growth of the ERIC system as a dissemination service was discussed in an earlier section of this report. In fiscal year 1969, about $750,000 in Cooperative Research funds was focused on projects designed to improve dissemination products and the channels for getting research results to those in a position to use them. The Office of Education copyright program was strengthened to facilitate dissemination of curriculum and other materials developed in projects or programs supported with Federal funds.

The Targeted Communications Program.—Projects to improve dissemination and encourage research utilization were designed to collect, synthesize, and interpret research findings for target audiences, to improve the processes by which research results are disseminated, and to speed the practical application of research findings. For example, current individualized instruction practices were studied at a workshop conducted by the Oregon State System of Higher Education, after which institutional representatives returned to their own groups to organize similar workshops. Materials developed by this project were made available at cost for other local and State workshops.

After an examination of mathematics research literature and data from ongoing mathematics projects, a Pennsylvania State University project made six teacher training films and prepared a series of brochures for school principals and those who train mathematics teachers. These are to be publicized and disseminated through national conferences, professional associations, and on national educational television.

One University of Tennessee project is developing brief research-based reports on problems of importance to school board members. Another concentrated on cooperation between schools and private industry, developed a model seminar to bring various groups together, and prepared materials for dissemination.

The Northwest Regional Educational Laboratory, Portland, developed materials for model seminars to be held in States with small rural schools. Working through State education agencies in Georgia, Montana, New Mexico, South Dakota, and Vermont, this project is designed to enlist the interest and cooperation of other States with similar rural school problems.

System Development Corporation (Falls Church, Va.) received support to study the work of education service centers. The project includes 10 regional seminars for key operating staff of education information centers to help representatives from 500 centers strengthen the total educational information network. Stanford University was awarded funds to conduct a summer institute for news and editorial directors to improve the quality of dissemination materials.

Late in fiscal year 1969, various interpretative materials were produced under an Office of Education experimental series called *Putting Research into Education Practice* (PREP). To strengthen State and local information services and speed the adoption of tested educational innovations, PREP publications are sent to State education agency dissemination coordinators to be reproduced and distributed throughout the State. A check based on the first five PREP kits made available showed that State education agencies had reproduced and further disseminated 40,000 copies. Further study was underway to determine how best to serve those States with limited reproduction facilities.

Copyright program.—The revised copyright program was originally announced in the Federal Register of March 1, 1968, and *Guidelines on Authorizing Limited Copyright Protection for Materials Developed Under Project Grants and Contracts* (OE-11018) were issued by the Office of Education in June. As the program became operational during fiscal year 1969, a committee of six public representatives passed on copyright authorization requests from grantees and contractors while procedures were being standardized. Later, the committee took on an advisory role and considered individual requests only when requests presented unusual problems.

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[3] Other studies related to computers in education are listed in a 1969 publication, *U.S. Office of Education Support of Computer Activities* (OE-12044, Superintendent of Documents, U.S. Government Printing Office), which summarizes projects supported for fiscal years 1967, 1968, and 1969.

During the year, 50 requests were received, and 39 copyright authorizations were approved, 22 for maintaining the integrity of materials being developed and 17 to facilitate the publication of finished materials. One of these publications, *Education in the States: Historical Development and Outlook,* developed under contract with the Council of Chief State School Officers and published by the National Education Association, was ready for sale at the end of June 1969.

PROJECTS UNDER SPECIAL ALLOCATIONS

Special allocations from Cooperative Research were used for small project research and for certain kinds of studies identified in the appropriations budget statements. Funds allocated for small project research were administered through the Office of Education's regional offices to bring administrative services closer to many of the participants in the total research effort. Funds for special study areas identified in the budget statements were used for the National Assessment Study and certain statistical surveys and evaluations to help the Commissioner fulfill his responsibility for determining the effectiveness of Federal programs administered by the Office.

Regional Research Program

The Regional Research Program was initiated in fiscal year 1966 when responsibility for small project research and related administrative assistance was decentralized to bring services closer to participants. The program is administered by Directors of Educational Research in the nine DHEW regional offices.

The program has two components: Regional Project Research (RPR), and Research Development Grants, known as Consortiums on Research Development (CORD), to help smaller higher education institutions develop their research competencies.

Regional Project Research (small grants program) supports projects that require a Federal commitment of no more than $10,000 and a time period of no more than 18 months. Grants may be awarded to colleges, universities, State departments of education, or to other public or private agencies, organizations, groups or individuals with institutional or organizational sponsorship. Research proposals in many fields of learning may qualify for support insofar as they relate to education.

This program encourages promising ideas from researchers in relatively isolated places and provides wider geographical distribution than any other research program in the Office of Education. During fiscal year 1969, colleges without a research tradition received nearly 30 percent of the funds, while many grants made to large institutions went to promising young researchers who were new in the field, with about 25 percent awarded for doctoral dissertations.

During fiscal year 1969 this program processed 984 proposals, 296 of which were funded through the Regional Research Program for a total of $2,553,000; 102 were approved but left unfunded because of lack of funds. Another 18 were transferred to other programs (10 to the Bureau of Education for the Handicapped and 8 to the Bureau of Adult, Vocational, and Technical Education) for a total of $131,123.

Projects funded included a wide variety of educationally related topics: 25 on computer-based instruction, 24 on the disadvantaged, 17 on reading, 15 on early childhood education, 14 on the mentally retarded, 14 on basic research, 11 on race-related studies, eight on the American Indian, six on urban problems, and four on student unrest.

The $449,800 support through the CORD program enabled 131 colleges from 21 States to pool their educational research resources and facilities for the third successive year. These groups ranged in size from a single institution with its own components (Emory University) to 30 institutions in the Oklahoma system. The average consortium comprises about five institutions. An initial grant of $50,000 was made to each CORD group, with the understanding that the grant could be renewed for a second and third year with decreased Federal support and increased local support each year.

Benefiting most from this program is the "research small" institution—one that received less than $20,000 in Federal funds from 1963 through 1967. Thus institutions without a tradition of research have the opportunity to improve the quality of their instruction, at the same time developing their research capabilities. Encouragement of this research effort becomes highly significant when it is realized that developing institutions comprise about 85 percent of the colleges in the United States. They serve a relatively large proportion of lower socioeconomic students and produce about 60 percent of the Nation's teachers. Of the colleges in the CORD program, 92 are in this research small classification, 18 of them having predominantly Negro enrollments.

In fiscal year 1969, there were 19 ongoing research development grants, all in their third year of activity. Budget restrictions prohibited any new grants, although over 30 groups applied.

Most of the research development activities consist of seminars, workshops, training sessions, and other strategies to stimulate research activity among faculty and other staff, but the consortiums are encouraged to carry out definitive research on their own programs. The following examples indicate how institutions put research theory into practice. A group of nine New York colleges developed a unified 3-year chemistry program and tested it in member institutions; five Georgia colleges designed a new curriculum for preparing teachers to serve underpriviledged youth; and the 30 colleges in the Oklahoma system set up statewide computer and television networks based on their cooperative research and development effort.

National Assessment Study

The National Assessment of American Education, also called National Achievement Study, is probably the most ambitious single project of its kind since the Office of Education first began reporting on the progress of education. Authorized by the 90th Congress, it was conceived as a means to gather and make available to educators and the general public the first censuslike data on educational attainments and to measure what growth increase—or decrease—takes place in selected aspects of those attainments over a period of time.

An exploratory Committee on Assessing the Progress of Education worked with hundreds of teachers, subject matter experts, and others to determine what and who should be assessed—and how. Initially, 10 subject areas and four age groups were selected. Three subject areas were chosen for the first cycle of the study: science, writing (composition), and citizenship. Seven others were chosen for the next 2-year cycle: literature, mathematics, social studies, music, reading, art, and career and occupational development. Repetition of the cycle would provide a measure of educational progress in these subject areas and in subcategories according to region, type of community, age, sex, race, and socioeducational status.

Instead of securing information for individual schools, school districts, or States, four geographic areas were chosen for sampling: Northeast, Southeast, Central, and West. Descriptive data about knowledge and skills, rather than scores for individuals, required a new type of testing, resulting in information exclusively for each exercise or question but not for any individual respondent. Information was to be secured for students at age 9, 13, and 17, and for young adults in the 26-35 age group. Four private research organizations were awarded contracts to develop objectives to be achieved in American education at the various age levels, summarize them, and review them regularly as the assessment proceeded. For example, one objective of citizenship reads: *Support rationality in communication, thought, and action on social problems,* with the subobjective that *students try to inform themselves on socially important matters and to understand alternative viewpoints.* Based on such objectives, plans were made for the initial testing, and instruments to be used in the assessment were designed.

During fiscal year 1969, the initial phases of the assessment were supported with $1 million from Cooperative Research funds, supplemented by contributions from the Carnegie Corporation of New York and the Ford Foundation. Most of these funds were used to draw the sample for the first cycle, to train those who would administer the tests, and to supervise the exercises for the first group, the 17-year-olds in school. The schools whose students were to be assessed had previously been chosen by random sampling procedures and notified by mail. In spite of some early misgivings by school administrators, 87 percent of the 770 selected schools agreed to participate. To standardize administrative procedures, district supervisors, employed by the contractor (Research Triangle Institute of North Carolina) and the subcontractor (Measurement Research Center, Iowa City, Iowa), trained others to administer the tests, using taped instructions. Participants numbered no more than 75 in most schools, as many as 150 in larger schools.

The same procedures will be followed for all in school age groups included in the assessment: 9-year-olds, most of whom have completed the primary grades; 13-year-olds, most of whom would be nearing the end of the intermediate grades; and 17-year-olds, who would be finishing secondary grades. Procedures for assessing the 17-year-olds out of school and the young adult group, age 26-35, will differ somewhat because these individuals will no longer be in formal educational settings.

Following lengthy negotiations, the Education Commission of the States (ECS), with headquarters in Denver, became the official agency responsible for the assessment in July 1969. The policymaking board consists of representatives from ECS and from the Committee on Assessing the Progress of Education, which had responsibility for administering the earlier parts of the project.

Evaluations and Statistical Surveys

In fiscal year 1969, about $1.25 million in Cooperative Research funds were used for 31 evaluation studies designed to help the Commissioner of Education fulfill his responsibility for assessing the effectiveness of programs administered by the Office. In general, these studies were planned to get needed data on effective programs or components of programs receiving Federal support or to provide a factual basis for shaping future program requirements.

Half of these projects and almost half of the funds were for studies about elementary and secondary education programs. Included were design development for demonstration education programs, construction of tests of literacy and occupational cognizance, further study of programs for the disadvantaged, and several studies following up the 1968 survey of compensatory education.

Higher education program evaluations included a study of institutions and recipients participating in the Educational Opportunity Grant Program, a study of the NDEA title IV fellowship program, and followup of a cross section of high school seniors.

Among the vocational and technical education evaluations were projects to study adult basic education, junior colleges, exemplary vocational programs in secondary schools, and vocational education projects in major metropolitan areas.

Other projects assessed manpower needs for education of handicapped children and youth, analyzed the effectiveness of the Teacher Corps Program, designed an evaluation system for educational personnel development programs, and studied educational researchers as a basis for assessing the research training programs. Cooperative Research funds also were used to contract for an analysis of American educational research and development, to be used at an international assembly of the Organization for Economic Cooperation and Development to be held in Paris in November 1969.[4]

The National Center for Educational Statistics used $137,000 in fiscal year 1969 Cooperative Research funds to contract for an elementary and secondary education school staffing survey, with major emphasis on personnel needed for adult education and nursery-kindergarten enrollments.

The evaluations and surveys described above were for specific work solicited by the Office of Education in order to improve the efficiency of programs it administers. Research activities reported elsewhere in this report include some surveys and evaluations for other purposes. Indeed, the typical supported research activity—large or small—carries a component for evaluation of its own effectiveness.

Major Pilot Projects

Only one major pilot project was supported under fiscal year 1969 appropriations from Cooperative Research. This was the Anacostia Demonstration Project, started in Southeast Washington, D. C. Working with the entire school system in the deprived Anacostia area, the project has two major goals: (1) to find ways to increase effective community participation in school governance and (2) to improve school performance through joint community-professional staff decisions. During its first year, efforts focused on initiating a major reading improvement program and strengthening community participation in solving many education-related problems in Anacostia. In the meantime, staff and community representatives refined plans and administrative procedures, and worked toward improved staffing and operation on a fuller scale in fiscal year 1970.

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[4] *Educational Research and Development in the United States, op. cit.*

IV. DIRECTIONS OF FUTURE EDUCATIONAL RESEARCH

The same conditions which have made adequacy of highways and other public services a national concern and a national responsibility now serve to make educational improvement a national responsibility. Though still depending upon local control and largely upon local financing, the school must serve a complex and highly mobile society where weak schools at one level or in one area are increasingly becoming a drag on all levels and all areas.

The medical field is almost unique in its application of research and development to practice. In education as in medicine, the client's progress often depends upon the adequacy of treatment and the way this treatment is internalized by the client. But there the analogy ends. Or does it? Suppose each locality's doctors were bound by what they alone or as a group could learn, and the treatments they themselves could develop. Important as a doctor's basic training may be, his continued success depends not only upon what he does in his own practice as a result of his initial training, but upon how well he applies the results of research and development from throughout the profession. In other words, the alert physician must replace obsolete diagnoses and treatments with new and better ones. Education needs that kind of attitude toward research and development, that kind of upgrading of local effectiveness by application of the best that is known, regardless of where those findings or materials or strategies come from. This cannot be brought about in a vacuum. It depends not only upon the attitudes of educators and their ability to communicate research and development findings, but also upon society's attitude toward education and its willingness to pay the price for progress.

Educational research may not be as dramatic as medical research. It may not be directly responsible for saving the life of the individual student; but it is responsible for helping devise the kind of learning, the kind of society, that gives life its worth and quality. Furthermore, every profession—not alone the medical and the educational—owes its progress to the quality of educational background on which it is able to build. Thus, while education has served other professions as a tool in their research and development, educators have only recently become aggressive in utilizing research and development to bring about needed improvements in the educational enterprise itself. In the past 10 years, more time, talent, and money than ever before have been invested in pushing outward the frontiers of educational knowledge and developing appropriate new programs and techniques. The basic issue is not whether, through research, we can prove that our schools are better than they were, but whether, through research, development, and implementation, we can make them live up to our ideals in serving society's changing needs.

The job is too big and too important to be left only to individual discovery and development in the various localities. It demands coordinated efforts. Improvements discovered or developed in one locality must be systematically available in another in time to resolve educational issues before they become impending crises.

In fiscal year 1969, some striking advances were being made as a result of educational research. Materials and techniques developed for early childhood education and individualized learning were particularly promising. Further clarification of relationships between learning, motivation, attitudes, and values were providing new avenues for improving education of minority and disadvantaged children. A new reading research technique had been identified to converge studies upon ways to help every child fulfill his right to read. Higher education institutions were reassessing their relevance and making program adaptations. Completely new approaches in teacher education were being studied. Steps were being taken to strengthen research training programs to prepare a greater proportion of needed developers and disseminators.

Staff responsible for administering Office of Education research authorizations responded to outside evaluations by intensively coordinated reassessment of research needs and accomplishments. Planning and management techniques were tightened in order to concentrate available research in critical areas. The Office's role in America's total educational research and development effort was further clarified during preparation for the May 1969 review by an international team from the Organization for Economic Cooperation and Development. With the concurrence of nongovernmental advisers, steps were taken to move toward deliberately announced priority areas in fiscal year 1970.

All of these interrelated factors led to the Commissioner's July 17, 1969, announcement of plans to combine the planning, research, and evaluation functions of the Office into a unified program. This could be the nucleus of a National Institute of Education, with the potential for making research as vital for advancements in education as it has been in medicine and other disciplines.

V. MISSIONS AND ACCOMPLISHMENTS OF EDUCATIONAL LABORATORIES AND CENTERS

Summary of missions, objectives, and major accomplishments of educational laboratories: Fiscal year 1969

Mission	Objectives	Major accomplishments
Appalachia Educational Laboratory (AEL), P.O. Box 1348, Charleston, W. Va. 25325		
To help rural and isolated schools upgrade their programs through cooperative relationships and modern technology.	To design an administrative structure for pooling rural educational resources for educational improvements and to develop educational programs which employ media and mobile facilities.	First operational cooperative was formed from group of seven East Tennessee school districts; initial structure and programs were field tested in the second and third developing cooperatives in Kentucky and Virginia. A design for an educational mobile facility was completed and used as the basis for a field test facility. Curriculums in driver education, clerical skills, and vocational guidance were designed and field tested for use in cooperatives.
	To develop a child-centered, home-oriented preschool program by using television, home visitations, and mobile facilities.	AEL prepared 140 half-hour television programs for 300 Appalachian children, developed lesson plans for teachers in two mobile vans and for eight home teachers, completed home visitor training program for parents of preschool children. A test to evaluate program effectiveness found significant gains in language and thinking, particularly for children receiving home visits as well as television.
	To develop self-instructional guidance systems that help secondary school students in Appalachia make vocational choices through self-assessment and use of occupational information data.	The *V*ocational *I*nformation for *E*ducation and *W*ork (VIEW) system was installed in 11 pilot schools (six in Tennessee and five in Kentucky); 400 view-scripts were developed and used in field tests. Two of 25 videotape recordings on occupations were completed and evaluated.
	To develop an Appalachia-focused reading and language program to give preschoolers and early primary children basic language skills for effective learning outside the school environment.	Scripts and audiotracks were completed for 20 prototype cartoon lessons. Early field tests of instructional material with 90 children in West Virginia showed significant gains in ability.
Center for Urban Education (CUE), 105 Madison Avenue, New York, N.Y. 10016		
To create an interaction among universities, public schools, and local communities that will improve the quality and relevance of urban education.	To provide relevant materials for inner-city preschool and elementary children and their teachers.	CUE field tested curriculum guide cards for the third-grade with 11,000 students and 575 teachers in New York City, Nashville, Tenn., and Bridgeport, Conn. Material on nine subject areas is now available from CUE.
		Training programs were completed for elementary science teachers in a joint effort with Hunter College, New York University, and Teachers College.
		Fourth-year investigation of beginning reading programs for inner-city schools was completed.

Center for Urban Education (CUE)—Continued

		Second year in early childhood curriculum was field tested with kindergarteners and 4-year-olds in nine schools. Pilot project supplementary materials for parents of prekindergarten children were completed. CUE field tested for the second year its "Planning for Change" curriculum to make social studies more relevant for inner-city elementary school children.
	To provide information and constructive models for changing the social relations between urban schools and local communities through (1) a decentralized clearinghouse reference center for the public and (2) training programs for teacher and community leaders.	A decentralization clearinghouse was field tested. Training program was pilot tested for teachers and community leaders associated with decentralized school districts. In cooperation with the New York City Puerto Rican Forum and Society of Bilingual Teachers, a 15-week training course in leadership for 100 Puerto Ricans and 35 bilingual teachers was completed.
	To provide general information on (1) issues in the field of urban education and (2) new center products, techniques, and knowledge.	CUE completed a prototype design for a neighborhood learning center to be used by elementary age children, teenage trainee leaders, and adult supervisors to test and create new urban-relevant learning activities and environments. CUE completed several monographs and published six issues of the *Urban Review* and issues of *The Center Forum* (a journal highlighting specific educational programs). A wide range of subjects was covered in 71 publications of the Center.

Central Midwestern Regional Educational Laboratory (CEMREL), 10646 St. Charles Rock Road, St. Ann, Missouri 63074

To contribute to the quality and breadth of curriculums and instruction throughout the Nation.	To develop a comprehensive school mathematics program (CSMP) for students ages 5-18 in regular classrooms in two interrelated individualized programs: an *activity* package component for grades K-12, and an *Elements of Mathematics* package component for junior and senior high school students.	The laboratory produced and pilot tested 23 activity packages for grade 3 in four third-grade classes. First phase of teacher training program was planned and initiated. Pilot models of a classroom information system were designed and implemented. Series of books for the *Elements of Mathematics* package was drafted.
	To develop alternative curriculum patterns in literature, music, visual arts, the dance, and theater arts that will provide students with artistic expression skills.	Clearinghouse for esthetic education material was established. Two prototype packages of materials for primary-level children were completed.
	To develop a learning disability program for inner-city and severely disabled psychotic and autistic children from preschool through junior high, including remedial procedures for teachers and therapists to effect permanent changes in behavior, attitudes, and skills.	Pilot model was field tested by Washington University Pre-school Laboratory, St. Louis Public Schools, and kindergarten program in Chattanooga, Tenn. Tests showed that reinforcement systems are adaptable in large classrooms and for underachieving ghetto children. Procedures have been established for placing hyperactive children in regular classrooms. Initial evaluations found the token exchange reinforcement system effective in reducing destructive behavior.

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Eastern Regional Institute for Education (ERIE), 635 James Street, Syracuse, N.Y. 13203

To increase the ability of students to acquire and apply knowledge through curriculums which stress process learning.	To increase school adoptions of high quality process curriculums which are already available but not receiving widespread use, by identifying and analyzing curriculums, modifying them to meet specific teacher-pupil needs, and installing them in a network of demonstration schools.	Teacher techniques and assessment instruments for ***Science: A Process Approach (SAPA)*** were being developed in 21 pilot schools. The program was extended to fourth-grade level. Teachers were trained to teach material in fifth grade in pilot schools. The SAPA network was expanded from 21 to 51 districts in Pennsylvania and New York with assistance from the National Science Foundation. At the same time, 48 professors from State colleges were selected as consultants to help install ***Man: A Course of Study.***

Educational Development Center (EDC), 55 Chapel Street, Newton, Massachusetts 02160

To bring about comprehensive change in total school systems.	To produce a model for total system intervention in which the content of the educational program, the methodology of teaching, the organization of the school system, and the approach to planning and policymaking are concurrently improved.	Pilot community programs, operating for 2 years in Boston, Bridgeport, and mid-coast Maine, and 4 years in Washington, D.C., have utilized resource teams and task forces (12-20 members) to work closely with teachers, administrators, and members of the community. Evaluation of the work of the Washington team is now available from EDC, for Boston team in 1970. In Washington, D.C., teachers, released to participate in team-sponsored activities, participated in 1969 summer reading institutes. The Washington, D.C., School Administration has developed a 5-year plan to divide its school system into instructional units, each unit to be supported by an instructional unit modeled after the innovation team. A film, ***Cloud Nine*** (discussing events following the death of Martin Luther King), was produced. In Boston, the team efforts shifted from training individual teachers in new curriculums to school staff involvement in program planning. EDC initiated planning with Boston Public Schools for a program for Spanish-speaking children. Workshops and institutes were established for Boston's teachers and administrators. Review of the Bridgeport and Maine sites revealed the difficulty of forming teams to work together; participants tend to work alone at their specialties (reading, math, science, etc.) rather than with larger groups or the school administration.

Far West Laboratory for Educational Research and Development (FWLERD), 1 Garden Circle, Berkeley, California 94705

To develop products and methods which enhance opportunities for learning.	To develop self-instructional training units which provide experienced as well as student teachers with critical teaching skills.	Commercial version of the first "minicourse" was completed and will be available for marketing in early 1970 (the Macmillan Company). Final field testing was completed for four courses using the minicourse models; two passed their main test. Courses were designed to train teachers in such skills as tutoring in elementary mathematics, effective questioning in secondary class discussion, organizing the kindergarten for independent learning, and small group discussions.
	To develop an information capability which gathers, organizes, interprets, and packages information at varying levels of complexity, and an educational and management system that will help schools obtain, evaluate, and act on information about research and development products, make rational decisions about research and development information, and put it into improved classroom practices.	The initial concept of prepackaged processed information was broadened to a more flexible information processing system. Field testing occurred for multimedia information packages on elementary science programs, individualized instruction, and social studies. Reports were published on the organization for planning and managing research and development information.
	To develop preschool and primary education programs to help children from 3 to 9 develop basic intellectual skills at higher and faster rates than usually achieved, while fostering positive attitudes toward themselves, the school, and learning.	(Program supported by the Headstart and Follow Through programs and the Carnegie Foundation. Laboratory program funds cover only general management costs.) Preliminary testing was completed on kindergarten materials, and a prototype for first-grade level was developed. A model toy library, containing educational games, puzzles, and toys with instructions for parents in their use, has been field tested.

Mid-Continent Regional Educational Laboratory (McREL), 104 E. Independence Avenue, Kansas City, Missouri 64106

To improve instruction through inservice and preservice training.	To develop instructional processes and classroom arrangements to ensure that teachers can foster inquiry and self-directed learning among high school students.	In inquiry role approach, 100 study guides were developed for the Biological Sciences Curriculum Studies (BSCS) high school biology course; 25 teachers were trained in problemsolving techniques to organize student groups and use study guides; selected supervisors planned a special training workshop; four-man teams from selected schools presented inquiry approach to teachers in their systems. Four instructional staff units were completed by the University of Nebraska for field testing. Tests to measure self-directed inquiry were completed in sophomore biology.
	To develop realistic preservice training in which potential teachers of inner-city children live and teach in an inner city, and work with community agencies to upgrade instruction.	McREL developed a prototype training program of one fully accredited semester experience in 30 colleges and universities and six public and parochial systems; 48 students in Kansas City, 30 in Wichita, and 27 in Oklahoma City completing the

Mid-Continent Regional Educational Laboratory—Continued

		training program. Two monographs were published: *Innovations in the Inner City,* describing the 16-week program; *Cooperation: A Key to Urban Teacher Education,* about formation of the school district consortium to conduct the program.

Northwest Regional Educational Laboratory (NWREL), 710 Southwest Second Avenue, Portland, Oregon 97204

To facilitate the adoption and effective use within the Northwest region of improved programs and practices emerging from educational research and development.	To develop materials for training teachers in practices emerging from research and development which develop children's thinking capacities and their abilities to make rational decisions in a changing world.	Two prototype teacher training systems, one on inquiry development skills and the other on the research utilization problem-solving process, were revised to provide for more self-directed learning. Systems for training teachers in five additional skills have reached various stages of development. These include: use of older children as tutors, questioning strategies leading to productive thinking, use of systems technology, preparation of training consultants, and interpersonal communication skills. The laboratory began the synthesis of prototype systems for training teachers in skills appropriate for verbal interaction with students.
	To develop instructional materials that utilize audiovisual media, permit student self-pacing, reduce the need for highly trained teachers, yet minimize the cost, as a means for expanding learning opportunities for children in rural isolated schools.	The laboratory completed the field testing and final revision of systems for high school in plastics, introductory welding, and electronics; speech has been redesigned after an initial field test; the design of full-year courses in physical science, Spanish, and advanced mathematics has been completed and full field testing initiated. "Patterns in Arithmetic," developed at the R&D center at the University of Wisconsin, was tested in grades one and two in five sites and suggestions for changes necessary for rural schools made. Plans have been developed to test change process models designed specifically for each state.
	To develop materials geared to the needs of isolated Alaskan native children.	Five levels of Alaskan language arts materials have been produced and pilot tested in 17 villages. Materials are self-paced, and use the "graphoneme" concept that delays the introduction of irregularities in English until child has gained some confidence in the language.
	To design programs for training community representatives and members of schools and other social agencies as working teams in joint educational efforts to improve education of inner-city and Indian communities.	Communication lines have been established with leaders of inner-city and Indian social groups and with educators and related agency personnel. Building on existing materials, prototype units for training working teams in some skills needed for joint efforts have been tested with working teams in the region.

Regional Educational Laboratory for the Carolinas and Virginia (RELCV), Mutual Plaza, Durham, N.C. 27701

To increase the capability of educational institutions, primarily 2- and 4-year colleges, for self-improvement.	To develop (1) administrative and organizational systems to lead colleges to research-based planning and decision-making, and (2) a learner-oriented instructional system based on behavioral objectives.	Model for Institutional Planning and Decisionmaking was designed. The role of educational development officer (who serves as researcher and advocate for change) was defined. Computerized information systems are being utilized; models for data collection and analysis were designed; workshops and seminars about program installation were planned. Learning-oriented instructional system based on behavioral objectives was designed to improve the quality of college instruction. Self-instructional materials demonstrating the system were used in workshops. Consortium of 15 junior and community colleges was established; 150 teachers were given released time to work in laboratory workshops.
	To adapt and diffuse materials developed elsewhere to increase pupil learning at the elementary and secondary level in the Carolinas and Virginia.	The laboratory in cooperation with Research for Better Schools field tested IPI mathematics in five elementary schools. The individualized mathematics system was designed to decrease costs, enrich content, and involve State and local personnel.

Research for Better Schools, Inc. (RBS), Suite 1700, 1700 Market Street, Philadelphia, Pa. 19103

To move American education toward an individualized, personalized, and flexible approach that promotes children's intellectual growth and their responsiveness to the changing world.	To develop a system, Individually Prescribed Instruction, which will enable students to work at their own rate, demonstrate mastery of basic skills, and become self-motivated for learning, and help the teacher deal with wide variations within the classroom.	Mathematics and spelling materials were revised; diagnostic handwriting tests were developed; and an adult reading program was formulated. Spelling, handwriting, science (1-2), revised reading, and audio-components in math were introduced into six development/demonstration schools. Training materials for teaching science, handwriting, spelling, and reading were prepared for school administrators and teacher aides for special aspects of the total IPI systems. Math training materials were redeveloped on the basis of evaluative data. IPI math was used successfully in 27 States, 97 schools, by 880 teachers and 23,000 students in the 1968-69 school year, expanded to 32 States, 165 schools, 1,600 teachers and 50,000 students in the 1969-70 school year. Portions of automated learning management system were developed for pilot testing in one demonstration school. Computer test was developed for IPI math placement, pre- and post-tests, and instructional materials.

Research for Better Schools, Inc.—Continued		
		A 60-page report, ***Progress Report: Individually Prescribed Instruction*** (August 1969), reviewed findings (available from Research for Better Schools, Inc., Suite 1700, 1700 Market St., Philadelphia, Pa. 19103, as long as supply lasts).
	To design skill-oriented curriculums to help students develop intellectual, social, and emotional skills.	RBS collected resource materials in 10 selected survey areas, produced anthology of selected classroom observation instruments, prepared basic program plan, developed first pilot "package" for elementary schools dealing with "power achievement" of pupils.
	To develop training programs and materials to provide administrative personnel with tools and methods needed to effect changes in school districts.	Staff studies were made of comprehensive planning and management tools and methods.
Southeastern Education Laboratory (SEL), Suite 221, 3450 International Blvd., Atlanta, Ga. 30354		
To alleviate educational deficiencies in the Southeast by providing alternatives to existing curricular materials and instructional strategies.	To improve curriculums and competencies in teaching communication skills to strengthen the educationally deprived child's communication skills.	SEL analyzed language samples of children in grades 1, 4, 7, and 10, and prepared materials for 32 kindergarten units, 72 units for both grades 1 and 4 in a *Multisensory Language Development* project, and 32 supplementary *Language Development Games.* Materials were tried out for 12 classes of each of these grades; games were used in 150 classes with some 2,000 pupils. A 10-unit sequence, *Language Science for Teachers,* was prepared.
	To halt or reverse intellectual and linguistic retardation of preschool children by using renovated school buses to transport curriculum materials and instructors.	Six readimobiles were operated in 41 sites (770 rural children) for 2 hours per week of readiness experiences (prepared by the Office of Economic Opportunity). Paraprofessionals were trained as instructors.
Southwest Educational Development Laboratory (SWEDL), 800 Brazos Street, Austin, Tex. 78767		
To meet the specific educational needs of Negro-, Mexican-, and French-American children.	To develop instructional materials for Negro and Mexican-American children that build self-esteem and skills critical to reasoning, conceptualizing, and problemsolving.	Instructional program materials for 3-, 4-, and 5-year-old Negro-Americans and a bilingual program for 3- and 4-year-old urban Mexican-Americans were pilot tested and refined.
	To develop a mathematics program that promotes in each student a positive self-concept and provides successful experiences in learning mathematics.	Mathematics instructional materials, grades 1-7, were pilot tested in El Paso and Baton Rouge.
	To develop a bilingual elementary program that teaches children subject matter in their native language at the same time they learn English as a second language.	Instructional materials were pilot tested and refined in oral language science, grades 1-5; oral language social studies, grades 1-3; reading, grade 1; oral and written English composition for the intermediate level. Teacher manuals were prepared for each set of materials. Handbook to help teachers emphasize expression of English

Southwest Educational Development Laboratory—Continued

		sounds was prepared. Testing was completed with about 260 teachers with 7,800 students in San Antonio, Harlem, and the Bronx, in addition to several counties in California, Louisiana, and in Philadelphia and other cities.
	To develop a multicultural social educational program that builds social concepts and skills, intellectual skills, and an appreciation of cultural diversity.	Multicultural social education instructional materials were pilot tested for first-grade Mexican-American and Negro-American children. Second-grade materials were designed.

Southwest Regional Laboratory (SWRL), 11300 LaCienega Blvd., Inglewood, California 90304

To change the nature of instruction to performance-referenced, computer-managed, and learner-controlled bases, and to develop a technology of instruction.	To develop kindergarten and primary curriculum materials to equip Anglo-, Mexican-, and Negro-American primary school children with basic communication and problemsolving skills.	A kindergarten and first-grade reading and a kindergarten concepts program were field tested. A comprehensive 4-year communication skills program (Model II) and an English oral language component for Spanish-speakers were designed. Prototype materials for music and art were developed and will be combined with kindergarten reading and instructional concepts to provide a comprehensive kindergarten curriculum.
	To establish accountability for pupil performance by training teachers, tutors, parents, and administrators to contribute directly or indirectly to ensuring that children master specific skills; by equipping staff groups with skills to monitor teacher's performance; and by training local units to assume responsibility for using the products of the laboratory.	Tryouts were completed for manuals for teachers; training materials for school district supervisory personnel were initiated; a model for summer parent-administered reading programs was developed; and a model was completed for a tutoring program using upper-grade pupils as tutors for kindergarten children.
	To develop an operational computer-managed instruction and administrative planning system.	Procedures for measuring outcomes of instruction were developed. Computer programs were written to score, analyze, and file the criterion-referenced measures; a guide for computer programers was completed. Computer system was tested with manuals for first-grade reading program; and (simulated) computer-managed instruction procedures were tested in five school districts. A practical querying and retrieval computer system was developed for budget planning.
	To develop a research base in the areas of language and conceptual skills, pupil populations, word attack skills, and comprehension skills in order to improve first generation SWRL products, new products, and provide a more rational basis for instruction.	Analysis was completed of the first and second year communications skills program. Data were collected on speech of black children in the region; analysis was conducted of the UCLA English as a second language program (Spanish dialect). A 9,000-word lexicon for 6-9 age level suitable for Model II of the Communication Skills program was completed. Studies were conducted on the relationship between reading proficiency and redundancy with words.

Southwest Cooperative Educational Laboratory (SWCEL), 117 Richmond Drive, N.E., Albuquerque, N. Mex. 87106

To improve the primary education of Indian-, Negro-, and Spanish-American children.	To attack the language problems of culturally diverse children, ages 3-9, whose first language is not English, by developing materials and programs needed for oral communication.	A new set of pronunciation exercises was constructed; tests were prepared for pupil evaluation; lessons were developed on cultural heritage; a film package of five films was produced using puppets rather than live teachers; teacher training materials were developed. Materials and techniques were field tested in six school districts with 145 classrooms, and a strategy was developed to install the program without help from the laboratory.
	To teach culturally divergent children concepts prerequisite to reading by developing an instructional program that minimizes cultural bias and develops new word meanings and concepts and gives extrinsic rewards (toys) for learning, with token awards that gradually taper off to intrinsic awards.	SWCEL modified 135 lessons and developed teacher training materials for a field test in 27 first-grade classrooms with 1,200 students.

Upper Midwest Regional Educational Laboratory (UMREL), 1640 East 78th Street, Minneapolis, Minn. 55423

To maximize children's attainment of learning objectives set by the community through the application of behavioral science to organizing and managing instruction more effectively.	To develop behaviorally engineered environments that maximize learning of elementary school children.	General goals and strategies were identified. Four demonstration classrooms were established, two in the inner city, two on an Indian reservation; the number was tripled in fall of 1969. Report was prepared on reinforcement of learning practices used in the Indian community and procedures for instructing teachers. Package was prepared for language arts teachers, *Backgrounds in Language*. Field testing was completed on *Dialects and Dialect Learning*. Report was prepared on a program to implement the Wisconsin Research and Development Center's multiunit organization; and a position paper was prepared on team teaching.

Summary of missions, objectives, and major accomplishments of research and development center activities: Fiscal year 1969

Mission	Objectives	Major accomplishments
GENERAL RESEARCH AND DEVELOPMENT CENTERS		
Learning Research and Development Center **University of Pittsburgh, Pittsburgh, Pa. 15213**		
To further interaction between behavioral science research and improved instructional practices.	To contribute to knowledge about the human learning process that will provide a scientifically sound base upon which instructional procedures and educational systems can be built.	Basic learning studies have been completed on techniques for reducing high variability of latency measures (time to respond); stimulus dimensions relating to the learning of discriminations; student preference for modes of instruction; differences between recognition memory and recall ability; encoding as a function of semantic structure; selective attention; basic preschool skills and concepts; diagnostic skills of teachers; and others. These basic learning studies have culminated in applied products, such as a beginning reading program with 12 readers and 12 workbooks, using such lab-based procedures as color coding, special type faces, immediate feedback, introduction of phonemes, and gradual increase of sentence complexity. (This program was tested in Pittsburgh and Boston.) Some programs initiated by the Center were placed under control of school districts. These included several independent study resource centers, and programs involving structural linguistics, inductive methods in social studies, individual laboratory work, music education, and comprehensive testing and self-appraisal.
	To develop prototype systems of education adaptive to relevant individual differences, to be tested, demonstrated, and analyzed in experimental schools.	Individually Prescribed Instruction (IPI) was started in one school in 1964 with individualized techniques in mathematics, reading, and primary science; since extended to other subject areas and extensively tested through Research for Better Schools, Inc., at six demonstration-development schools and 170 field schools preparatory to commercialization. An operational model of a computer-managed instruction system was developed and installed at the IPI experimental school, with remote tie-ins to the Center for continued monitoring. In conjunction with the Philadelphia-based laboratory, an evaluation system was set up to provide base for revising materials and procedures. Incidental results of first-generation materials have shown little dif-

Learning Research and Development Center—Continued

		ference in standardized tests between IPI and non-IPI students but more favorable school attitudes with IPI.
		The Primary Education Project (PEP), operating in a separate experimental school, has instituted a program for preschool children from a highly heterogeneous central-city population.
	To improve subject matter learning in individualized education by developing computer-assisted instruction curriculums, experimenting with student consoles and computer language, and installing successful components of the system.	Computer-assisted programs in spelling, introduction to numbers, and time telling were developed and given first testing. Several programing languages, with user's manual, were developed, and a time-sharing computer facility to support other projects within the Center was made operational.
	To design a learning environment within which even very young children can acquire complex skills by employing electronic and other devices.	Logical systems for characterizing the formal structure of learning environments were constructed. A demonstration project showed how deprived ghetto children could achieve high levels of competence in basic intellectual skills while enjoying it.

Center for the Advanced Study of Educational Administration
University of Oregon, Eugene, Oreg. 97403

To develop organizational and administrative arrangements which can cope with rapidly changing instructional techniques, strategies, and educational goals.	To determine the social forces and internal administrative arrangements which inhibit or enhance the adoption and implementation of new instructional techniques, strategies, and goals in public schools; to find out how and by whom decisions are made, and upon what bases school administrators and teaching personnel determine instructional policy.	A training manual was developed for use in improving group resources, increasing organizational participation, clarifying roles, improving problemsolving ability, and enhancing staff meetings.
	To produce knowledge that will help school personnel foresee the probable organizational consequences of introducing selected innovations in instructional programs.	Preliminary reports were prepared from data collected on organizational variables and innovations in the State of Washington, in Wisconsin where schools have adopted the multiunit plan, and in Pennsylvania where schools have adopted IPI materials.
	To develop tactics and strategies for change, based on group decisionmaking and problemsolving; to evaluate the effectiveness of these tactics and strategies and help schools acquire the skills in choosing innovations, putting them into operation, and stabilizing them.	Out of research activities, the Center has prepared 19 monographs, which have been widely distributed for use by administrators or for reference use in university libraries. The monograph *Issues and Problems in Contemporary Educational Administration* appeared in Pi Lambda Theta's list of outstanding books.
	To develop analytical schemes and supporting information suitable for managing school instructional programs, by developing and applying such analytic	"Improving Organizational Problem Solving in a School Faculty" received the Douglas McGregor Memorial Award, granted annually for the outstanding arti-

Center for the Advanced Study of Educational Administration—Continued

	tools as systems analysis, operational research, modeling, and simulation.	cle describing attempts to integrate research with actions concerning human behavior and organizational structure.
	To develop, test, and evaluate integrated sets or packages of instructional materials to help administrators and school personnel make rational decisions about instructional innovation.	Developed an inventory of critical issues in school administration.

Wisconsin Research and Development Center for Cognitive Learning
University of Wisconsin, Madison, Wis. 53705

To improve educational practices through a better understanding of cognitive learning and instructional processes, focusing upon a comprehensive system of Individually Guided Education in the elementary school.	To study the conditions and processes associated with efficient cognitive learning, including such areas as cognitive operations, individual differences in motivation and retention, memory, creative problemsolving, prereading skills, and peer teaching techniques.	The Center has identified some of the necessary prereading skills, refined the system of individually guided motivation, published an extensive bibliography on concept learning; and developed a training program, "Thinking Creatively: A Guide to Training Imagination." which is reaching 2,500 children in 10 elementary schools.
	To study the processes and programs of instruction, identify sequences of concepts and cognitive skills within and across disciplines, and develop instructional materials for them; also, to study the following instructional procedures: motivation, individualization, and classroom management.	*Patterns in Arithmetic,* a complete television course for grades 1-6 with 336 15-minute videotape lessons and teacher's manuals, has been completed and is being distributed nationally by the National Instructional Television Center, Bloomington, Ind., and by the Northwest Regional Educational Laboratory. It now is reaching 358,000 children and 10,000 teachers in 15 states. Also developed were 22 programed lessons in structural and transformational grammar for junior high school students and a set of experimental instructional materials in elementary science concepts. The third edition of the ***Wisconsin Prototypic System of Reading Instruction in the Elementary School*** was completed. To provide a structure for developing an individually guided reading program for grades K-6, reading skills were sequenced into word attack, comprehension, study skills, self-directed reading, interpretive reading, and creative reading. One or another component of this prototypic system is reaching an estimated 25,000 children in Wisconsin and 10,000 outside the State.

Research and Development Center in Educational Stimulation
University of Georgia, Athens, Ga. 30601

To study the influence of early educational stimulation in a school setting on development from age 3 to 12, building cumulative achievement from preschool through early elementary levels.	To provide theoretical schemes and a psychological base on individual characteristics and environmental learning influences on children, ages 3-12, for the development of instructional materials.	Staff of the Center served as consultants to curriculum coordinators. Bibliography on basic and applied research programs and influencing variables in developmental psychology were completed.
	To develop instructional materials for maximum and early stimulation of children in seven subject areas: art, language arts and verbal learning, mathematics, music, physical education, science, and social studies.	Additional materials in individual subject areas were developed and coordinated in the Clayton County Field Center and in Follow Through communities in Ohio, Virginia, North Carolina, South Carolina, Georgia, and Mississippi. Reading and language arts materials were developed through third grade, the science curriculum adapted to existing curriculums, specifically *Science—A Process Approach.* Social studies curriculums from the Minnesota Center and units developed by the Georgia Center staff and in the region were adapted for the primary grades, and preliminary materials were prepared for preprimary grades. Other curriculums were also tested.
	To evaluate ultimate effectiveness of early stimulation.	Curriculum evaluation was continued as instructional materials evolved for children aged 3-12.

Research and Development Center for Teacher Education
University of Texas, Austin, Tex. 78712

To improve practices in teacher education, concentrating on systems for the individualization and personalization of teacher education.	To provide information on teacher concerns and abilities, and to develop procedures useful for counseling and assessing of teachers and for maximizing the impact of the teacher education program on the individual.	An empirical three-stage model of the personal concerns of teachers was developed, together with procedures for assessing the concerns of prospective teachers. Recent products include new and improved assessment scales, a draft manual for teacher educators describing the concerns and the scales for measuring them, suggestions for arranging course content in accord with trainee personal concerns, some slide materials for use directly with trainees, and a set of recommendations for using video films in the assessing and counseling of teachers. Research on ways of increasing teachers' affective gain has included studies of psychological feedback from counseling, behavior feedback from videotaped playbacks of teaching, and situational feedbacks from specialized practicum situations. One videotape module provides new teachers with strategies for motivating students.
	To produce planned components of a teacher education system, including instructional modules applicable both to preservice and inservice training, with	Writing was completed and testing started on 10 out of a set of 39 math-science modules. When completed, they will cover 45 percent of the formal teacher training

Research and Development Center for Teacher Education—Continued

	special emphasis on instructional design, self-paced learning, personalizing techniques, and promotion of both the cognitive and affective components of effective teaching.	for those specializing in the teaching of math and science. Video portions were completed for a set of modules covering seven basic areas in social studies for the elementary grades. Seven modules on team teaching were written and testing started. Writing was completed and testing started on two of four modules covering organizational constraints in school systems, using a role-playing game situation as the medium for instruction. The writing and testing of a six-component teaching laboratory training set covering fundamental teaching skills is progressing. One unit, in the behavioral science foundations, was adopted for all teacher trainees at the University of Texas.

Stanford Center for Research and Development in Teaching
Stanford University, Palo Alto, Calif., 94304

To improve teaching by specifying future roles for teachers and designing training programs for these new functions.	To emphasize heuristic styles of teaching that will develop self-initiated and self-directed pupil learning.	The microteaching technique was further refined. At least 140 accredited teacher training institutions now use it, many extending its range. In addition to the Center's own training films on technical skills, a package of 34 films and 10 teachers' manuals has been released by a commerical firm. The Far West Laboratory, further developing the minicourse concept for teachers already in service, uses TV facilities for these courses. Continued work on specific skills of explaining resulted in such products as a minicourse on higher order questioning, a taxonomy of teacher questioning behavior, and syllabuses on teaching foreign languages (French, Spanish).
	To help develop a highly flexible school environment for improved teaching and learning.	Research studies using classroom or school settings dealt with such topics as the efficiency of teaching teams on decision tasks, attitudes of beginning teachers toward their jobs and toward students, teacher evaluation, teacher autonomy, teacher role in the traditional vs. innovative school, and the function of decision-making processes in aiding innovative changes in schools.
	To improve the training of teachers in minority or poverty communities, identify the skills needed by them in resolving crises, and improve their functions as agents of change.	Storefront office opened in lower-class area to investigate and improve community avenues for influencing their educational institutions; manual prepared for educational community organizations.

Stanford Center for Research and Development in Teaching—Continued

		Center's staff collected information about special characteristics of teachers who have ability to relate to all ethnic groups.

Center for Research and Development in Higher Education
University of California, Berkeley, Calif., 94720

To help higher education educators and organizations improve the quality, efficiency, and availability of offerings.	To study the impact of higher education upon student development and their careers, the changes that take place in college youth, and the effects of learning experiences on students from varied ethnic and socioeconomic backgrounds.	The Center annually sponsors an institute with the Western Interstate Commission on Higher Education on a major issue in higher education. Center personnel also serve as consultants to institutions and State governing bodies and present research findings at numerous conferences and seminars.
	To develop model structures and processes for planning and organizing programs for students, faculty, and administrators and yet sustain the confidence of powerful outside interest groups.	The Center's accumulated research data have been stored in a data bank for longitudinal followup studies. With some additional support from the Carnegie Commission, Center staff prepared and published *Inventory of Current Research on Higher Education,* summarizing 921 projects. Short articles in the *Research Reporter* quarterly serve as a link between 5,000 college and university administrators and faculty.
	To develop model programs for postsecondary institutions, community, and 4-year colleges, to meet the needs of an urban society, particularly subgroups in the lower half of student population.	A *Profile on Junior Colleges,* summarizing the Center's findings, is being used by the Carnegie Foundation in further study on junior college systems. Other studies were completed on the community college system in California, accreditation of technical programs in community colleges, and assessment of effective teaching.

Center for the Study of the Evaluation of Instructional Programs
University of California, Los Angeles, Calif., 90024

To improve the theory and methodology of evaluation by developing materials, techniques, and systems which can be used by educational agencies to evaluate effectiveness of school programs and practices.	To construct a model and methodology for evaluating instructional practices, programs, and procedures, including educational innovations, curriculum development, methods of instruction, technological aids, and day-to-day classroom teaching.	A definition of evaluation was evolved and a framework, consisting of five areas, designed to provide a basis for the Center's major programs. These five areas include: systems assessment, program planning, program implementation, program improvement, and program certification.
	To construct a model and methodology for evaluating educational systems, including (1) studies for evaluating elementary schools on the basis of information about student performance and the variables by which performance is influenced, and (2) studies of higher education which explore a broad range of social indicators and consequences.	An Instructional Objectives Exchange, through which educators can deposit and withdraw sets of operationally stated objectives, was established. Also, a network of approximately 20 pilot schools, located throughout the Nation, was established to provide a natural setting in which to develop and evaluate additional objectives and to study questions concerned with objective-based instruction.

Center for the Study of the Evaluation of Instructional Programs—Continued

		An evaluation kit was developed to help elementary school principals assess student performance across a wide range of concepts and skills and interpret the results of this information, and to provide a basis for making valid decisions for improving student performance levels. The 10,000 readers of *Evaluation Comment,* a Center publication, were surveyed. Results suggested the quarterly had a significant impact on the thinking and research activities of the respondents.

Center for the Study of Social Organization of Schools
Johns Hopkins University, Baltimore, Md., 21218

To study the influence of the social and administrative organization of the school, the community, and the family on student learning.	To evaluate the role of simulation games, extend basic research on games as social learning tools, serve as a clearinghouse for research on games, understand the relationship between natural games experiences and development of social skills or personal traits, establish optimal conditions for use of games in the classroom, and examine the effects of games on restructuring teacher-student roles.	Material developed, tested, and made availble for workshops included a variety of simulation games suitable for upper elementary, junior, and senior high school social studies; a curriculum kit for the Legislative Game; and a spelling game for eighth-grade low achievers. Tests and other instruments have been developed for a cross-cultural study of how natural games mediate learning.
	To provide a basis for evaluating and formulating policy which influences the progress made by presently disadvantaged minority groups, by developing a framework for monitoring the assets and deficits of different groups and determining the part educational institutions play in converting deficits to assets.	A national survey of intragenerational mobility was completed, and a survey instrument, developed to collect data on retrospective life histories yielded the most complete set of career histories of adult males ever available, thus permitting comparisons to be made between whites and Negroes in greater detail than is usual in any but the largest national surveys. Methods for arranging the coded survey information on computer tape, together with retrieval programs which permit data access for planned analyses, were developed.
	To examine the effects of social organization (home, community, and school) on the acquisition of student motives and cognitive styles; and to study how these are related to academic performance, and how progress can be promoted by organizational changes.	Analyses were completed on the allocation of various educational resources among school systems with different racial and social class compositions. Instruments for measuring "need achievement" and intellectual curiosity were developed.
	To develop effective training approaches in educating elementary school children who speak a nonstandard variety of English.	A training program on spoken standard English was designed for late elementary school classes. Six lessons, or modules, on fifth-grade level were completed.

EARLY CHILDHOOD RESEARCH CENTERS

National Laboratory on Early Childhood Education[1]

Headquarters:
National Coordination Center[1]
University of Illinois, Urbana, Ill. 61801

Component Centers:
Arizona Center for Early Childhood Education
University of Arizona, Tucson

Early Education Research Center
University of Chicago

Research Program in Early Childhood Education
Cornell University, Ithaca

Research Center for Early Childhood Education
University of Kansas, Lawrence

Demonstration and Research Center for Early Education
George Peabody College for Teachers, Nashville

Center for Research and Development in Early Childhood Education
Syracuse University

To improve early childhood education through the production of knowledge and the development of programs which provide the appropriate skills and sustaining motivations necessary for academic success and effective participation in a rapidly changing society.	To develop a capacity for integrating program efforts for maximum progress in improving early childhood education. (Specialized research and development at the component centers is integrated into the total effort through planning and management activities at the National Coordination Center.)	The major programs (across all centers) are (1) research on the effects of individual characteristics on learning, (2) research on environmental influences on the educability of young children, (3) curriculum research and development to design effective educational intervention, (4) development of educational change agent roles, and (5) development of evaluation techniques and supporting technology. Cooperative efforts focused on analyses of needed research, syntheses of existing knowledge leading to future applications, and conceptualization of future directions.
	To carry out a focused research effort on the processes underlying the development of competency in early childhood.	Research has been undertaken on the processes underlying development of competency, including cognitive functioning in language; visual memory and orienting behavior; short-term memory; effects of individual or personal variables upon performance outcomes; and the influence or effect of environmental conditions or agents on educability.
	To study the effect of experimental interventions in changing the development of competency.	Investigations have included programed procedures for the development of preacademic skills, a natural language curriculum, instructional methods and techniques which take into account the effects of teacher style on preschool achievement, types of concept attainment tasks, and instructional delivery systems, including new educational change roles.

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[1] Name changed June 1, 1970, to National Program on Early Childhood Education, and coordination center moved to Central Midwestern Regional Educational Laboratory, St. Ann, Mo.

National Laboratory on Early Childhood Education—Continued

	To create the research technology necessary to support broad research and development on early childhood education.	Assessment instruments designed and validated include basic concept development tests; measures of syntactic structure; and statistical models by which long-term intervention studies can be evaluated.
	To develop early childhood education models based on existing evidence and appropriate for installation under a variety of conditions.	As effective experimental interventions are validated, they will be incorporated into appropriate models.

POLICY RESEARCH CENTERS

Educational Policy Research Center
Stanford Research Institute, Menlo Park, Calif. 94025

To develop analyses about human needs and reactions which educational policymakers at all levels and in all jurisdictions may use to extend the time range and improve efficiency in considering policy development and making policy decisions in education.	To develop future pictures of alternative possibilities for education to serve society, based on: Analyses of human needs, beliefs, and values, and Relationships of need-value-belief systems to economic, political, social, and technological variables.	The Center extended its methodological innovations, using need-value-belief systems as the bases for projecting futures. Applying anomaly relaxation methods from the physical sciences to the social sciences, they developed a set of projections of self-consistent plausible futures. Staff also studied Utopian literature to gain perspective on alternative futures and investigated the significance and impact of revolutionary forces on society in the present and in the longer term future. From the futures projections developed through these methodologies, the Center turned to further explorations of implications for educational policy.

Educational Policy Research Center
Syracuse University Research Corporation, Syracuse, N.Y. 13210

To study alternative futures or paths for education (to about 2000), learning the consequences, direction, costs, desirability, and practicality of such alternatives, and testing their plausibility, consistency, and relevance.	To develop pictures of alternative future possibilities for society and its demand upon education, based on: Projections of sociocultural, political, educational, demographic, technological, and economic trends, Use of computer technology to project the effects of a range of possible conditions or events such as changing values and teacher and student militancy, and Implications of trends and alternative policies.	In establishing research definitions and style for research procedures, the Center concentrated on six methodological approaches: (1) Delphi method for systematically collecting expert judgments for consensus on a forecast and judgments on alternative forecasts; (2) cross-impact matrix (to be computerized) to assess the mutual impact of a large number of events and the strength of these relationships; (3) goal analysis, to assess alternative goals; (4) new techniques to reconcile economic pressures with alternative future educational plans; (5) relevance tree (like an organizational chart) to determine what elements or entries have not been included in educational forecasting (4,000 entries now being used); and (6) inventory of propositions describing the existing educational systems that will form a basis for future models (60 completed, ready for modification).

Educational Policy Research Center—Continued

		Projects were under way for studying social futures (educational environment) and educational futures. Those on social futures include alternative economic futures, social and technological environment, political context of education, and ideologies in thinking about the future. Studies on educational futures include the profession, the schools and instructional systems, postsecondary education, the learning force, the education complex, and educational planning.

VOCATIONAL EDUCATION RESEARCH AND DEVELOPMENT CENTERS[2]

Center for Research, Development and Training in Occupational Education
North Carolina State University, Raleigh, N.C. 27607

To improve the quality and accessibility of occupational education for all persons and groups in each community through research and related activities.	To improve the accessibility of appropriate occupational education.	Studies were completed on occupational employment to develop working statistics for future research and practice. Investigations of teenage unemployment, using interdisciplinary and interinstitutional cooperation, traced teenage labor markets, explored different experiences of Negroes and whites, and assessed educational and training opportunities for unemployed youth. Other efforts were concerned with effects of school integration on occupational expectations, the influence of the labor market and wage structure on occupational education offerings in technical institutes, and the occupational guidance role of public school guidance counselors.
	To facilitate coordination between occupational education and other programs.	Theoretical and research monographs were produced on internal-external control of learning, participation in occupational education, and structure of occupations including application of role theory and methodological suggestions for occupational analysis. Developing a national inservice training program for vocational educators involved extensive coordination among institutions and participation of over 500 persons in training institutes.
	To assess the efficacy of occupational education systems.	Evaluation and accreditation were the primary focus of activities in this area. Data evaluating the Concerted Services in Training and Education program resulted in several preliminary reports. A national seminar was conducted on research in evaluation. Efforts to develop accreditation standards for postsecondary occupational education included a regional seminar to synthesize problems, develop guiding principles, and specify communication strategies between state leaders and accreditation agencies.

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[2] Supported under authorizations for vocational education research (P.L. 88-210) during fiscal year 1969.

Center for Research and Leadership Development in Vocational and Technical Education
Ohio State University, Columbus, Ohio 43210

To strengthen occupational education programs, consistent with individual needs and manpower requirements.	To provide continuing reappraisal of the role and function of vocational and technical education in a democratic society.	Further development of a practical evaluation system for vocational-technical education included study of the roles to be carried by the Center and the States, objectives for State programs, procedures for evaluating. The system was field tested in Colorado, Kentucky, and New Jersey.
	To stimulate and strengthen the capacity of State, regional, and other groups to conduct research and development which generates new knowledge and applies existing knowledge to pressing vocational and technical education problems.	The Center published a comprehensive synthesis of the literature on youth in transition from school to work and was instrumental in securing publication of a book on career development. Cooperative relationships with universities and other organizations resulted in planning and developing vocational education curricular materials, cosponsoring national training institutes and leadership development activities, and expanding opportunities for pilot and field testing. At a national planning conference, industrial arts research and development activities were identified as needing priority attention.
	To conduct needed research directed toward development of new knowledge and new applications of existing knowledge in vocational and technical education.	Research and development products from the Center included 16 guides for use in planning vocational-technical facilities, a manpower planning model for State use, and an econometric forecasting model for estimating State occupational needs and their effects on curriculums. Efforts to improve staffing included a model system to prepare teachers by identifying competencies and developing performance goals for model curriculums. Experiments and demonstrations with microteaching and video-recording methods were carried out and field tested in Colorado, New York, and Ohio. Methods for preparing teachers of the disadvantaged were tested in summer workshops at San Francisco State College, Temple University, and Hunter College before further testing in different States. Revision of business and office curriculums was undertaken from regional data on jobs and industries. A model health occupations curriculum guide for rural high schools was developed, and materials were prepared to improve vocational attitudes and planning ability of high school girls. Guidance materials were made available from a survey of 7,000 parents, students, counselors, teachers, and principals. Data from a national sample of youth opportunity center counselors and newly

Center for Research and Leadership Development in Vocational and Technical Education—Continued

		employed youth were collected to identify major difficulties of youth adjustment to work.
	To upgrade vocational education leadership (State supervisors, teacher educators, research specialists, and others) through advanced study and inservice education.	Leadership development activities included seminars, institutes, and other programs for State directors, vocational and technical education teachers, community college personnel, and researchers. An interdisciplinary workshop was held for special education and vocational education teachers, and a national leadership development institute was devoted to planning, programing, and budgeting systems. Simulated training packages in decision-making and planning were developed for new State supervisors and pilot tested in OE region V.
	To facilitate the work of a national information storage, retrieval, and dissemination system for vocational and technical education.	Center staff collaborated with ERIC Clearinghouse staff and representatives from State Research Coordinating Units in developing a guide for State vocational-technical education dissemination systems; preparing abstracts of instructional materials and of research and related materials in vocational and technical education, each with appropriate indexes; drafting reviews and syntheses of research in health occupations education and the economics of vocational education; and abstracting materials for a manpower research inventory.

HANDICAPPED CHILDREN RESEARCH AND DEMONSTRATION CENTERS[3]

A Comprehensive Research and Demonstration Facility for the Handicapped
Teachers College, Columbia University, New York, N.Y. 10027

To carry out long-range comprehensive research and demonstrations on the education of handicapped children (mentally retarded, emotionally disturbed, physically handicapped, visually impaired, and language and hearing impaired).	To analyze school tasks in terms of psychological processes, learner assets and deficits in mastering the tasks, and instructional systems in facilitating the learning; and to develop a psychoeducational taxonomy that will mesh learners, tasks, and instructional systems for the most efficient education of handicapped children.	Facility planning was completed. Research teams in the areas of mental retardation, emotional disturbance, and physical handicaps were established, and six individual projects were completed and reported. Support programs in educational media and computer-assisted instruction became operational. Summer research training workshops were continued and a full-time research training program was initiated.

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[3] Supported under authorizations for research on education of handicapped children (P.L. 88-164) during fiscal year 1969.

Center for Educational Research and Development in Mental Retardation **Indiana University, Bloomington, Ind. 47405**		
To stimulate, facilitate, conduct, and coordinate a variety of research and development activities to improve educational practices with the mentally retarded.	To enable mildly retarded children to move through school successfully without being identified as retarded; and to enable children identified as mildly and moderately retarded during school to enter adult life as nonretarded, functional, and acceptable members of society.	The Center's first year of operation was devoted to program development, organization, planning, and staff recruitment. Programs in language behavior, curriculum development, and social status of retardates were established.
Center for Research and Development in the Education of Handicapped Children **University of Minnesota, Minneapolis, Minn. 55455**		
To produce materials and procedures appropriate for education of the handicapped under an improved definition that is relevant for instructional decisions and more functional than gross categorization by type of handicap.	To study educationally relevant characteristics of handicapped children in interaction with various treatment systems; to study the interactions of specific attributes of handicapped children with available methods and materials; and to develop and field test new materials and procedures based on the outcomes of aptitude and treatment interaction studies.	In its first year, the Center's major efforts were directed at staffing and developing an appropriate organizational and operational structure. Initial research efforts were directed at clarifying the educational relevance of existing categorical definitions of handicapped populations.

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